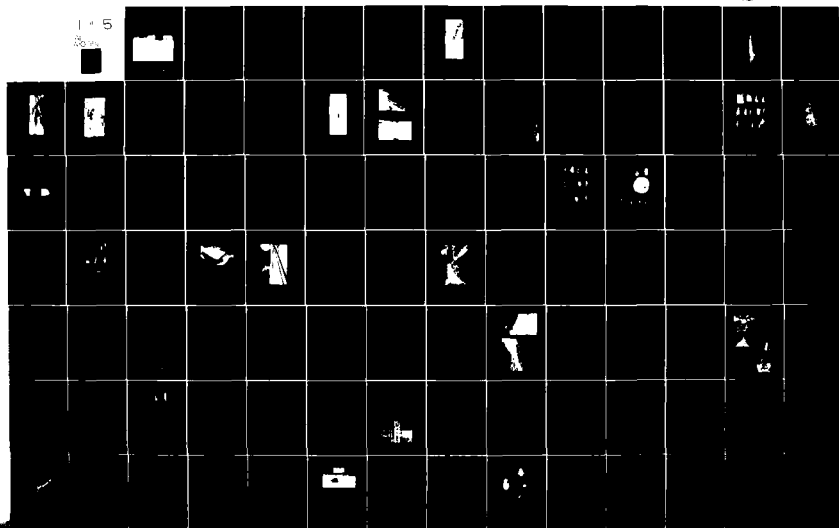


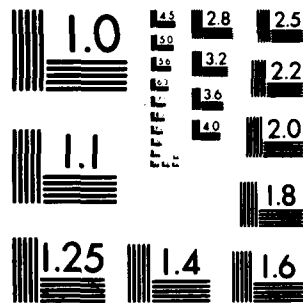
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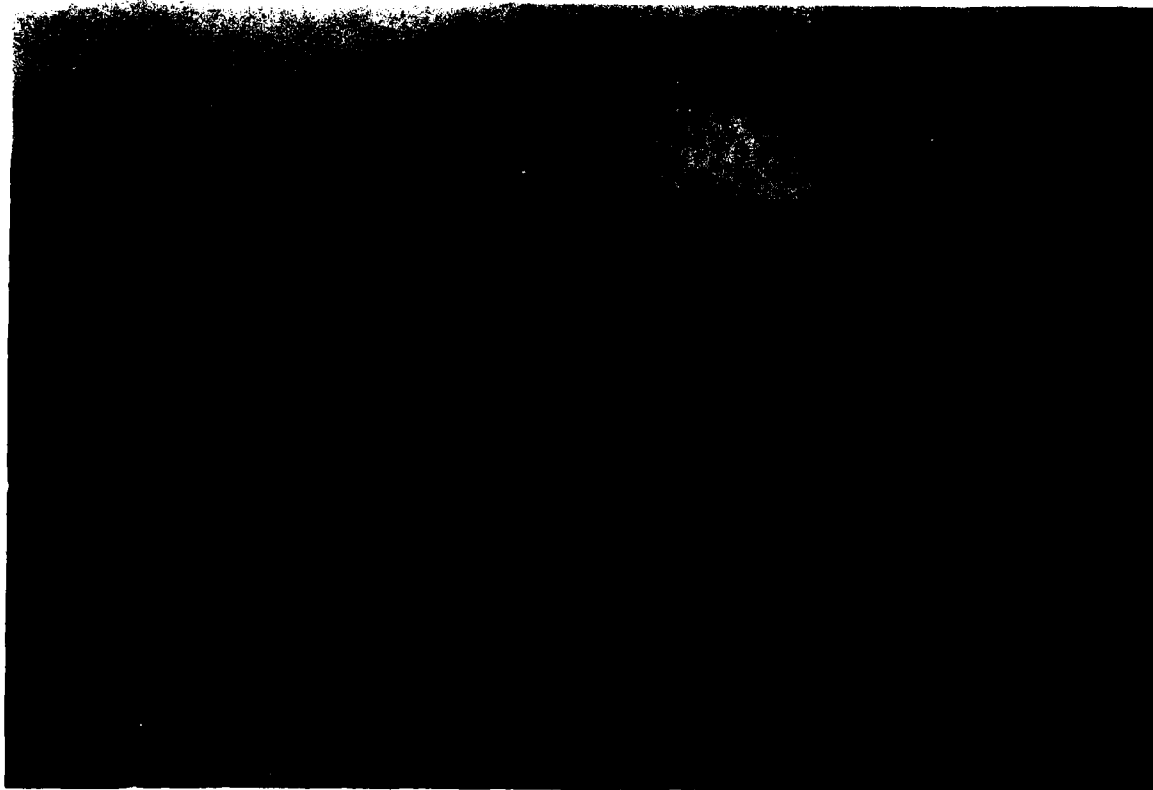
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CULTURAL RESOURCES INVESTIGATIONS
AT
REDSTONE ARSENAL
MADISON COUNTY, ALABAMA
Volume II



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CENTRAL RESOURCES INVESTIGATIONS
AT

REDSTONE ARSENAL,
HADISON COUNTY, ALABAMA.

Volume II.

Edited By

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Mobile District, U. S. Army Corps of Engineers

Under Contract With
Water and Air Research, Inc.

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Report of Investigations No. 35

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8. SITE DESCRIPTIONS

By Carol S. Weed, John P. Lenzer, and L. Janice Campbell

This chapter presents a detailed discussion of the 43 sites investigated during the course of the present survey and testing program. Of that total, 21 were previously known sites that were scheduled for test and evaluation, whereas 22 sites were located by the sampling survey. Of the 22 sites encountered during the survey, five were subsequently included in the testing program. In order to illustrate the site locations in relation to environmental surroundings, the descriptions are arranged according to the seven physiographic zones defined in Chapter 6. Following the discussions of the geologic settings of each site or groups of sites within the various physiographic zones, a description of the archaeological investigations and results are presented for each site.

Upland Alluvial Terrace North of the Recent Tennessee River Terrace

Five sites, 1Ma31/32, 1Ma33/50, 1Ma140, 1Ma49, and 1Ma142, are located within this physiographic zone, and, although as a group they exhibit similar geological settings, there are certain differences between the sites. As a result, the settings of the first three sites are discussed together, while separate descriptions are provided for the last two sites in conjunction with the archaeological discussions.

1Ma31/32, 1Ma33/50, 1Ma140: Introduction and Topography

These three sites lie along an elongated rise above a swale in the recent Tennessee River terrace. The crest of the rise lies at elevations between 174.6 m (573 ft) and 175.9 m (577 ft.) ASL, and the axis of the swale to the south lies below 170.7 m (560 ft) ASL. Both the slope between the two levels and the bottom of the swale have been mined for gravel in historic times. However, where the natural surface has been preserved, it is a lightly dissected, eight to ten degree slope. On the map it forms a broad arc roughly parallel to the present Tennessee River northern bank. At the east end of 1MA31/32 is an artificial channel which presently conforms to a second order stream rank that drains the southern slopes of Bell Hill and Little Farley Mountain east of Bell Hill. This channel was formerly a natural stream that flowed into the Tennessee River until it was altered during the historic period (Figure 16).

Fluvial sediments (including gravels) lie below the surface of the terrace on which 1MA31/32, 1MA33/50 and 1MA140 are situated. There is no doubt that this terrace was formed as a bank of the ancestral Tennessee River, and was subjected to erosion by a later phase of that river with a lower base level. Potable water was probably ponded in the river terrace swale, and was probably at least seasonally available in the former natural stream at the east end of 1MA31/32. Judging by the locations of prehistoric sites, the northern bank of the Tennessee River in post-Archaic times was probably in its present position, some 400 m (1312 ft) south of these sites.

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1Ma31/32: Archaeological Investigations

This site was originally investigated by H. Summerfield Day, who considered it to be a group of related sites that were individually designated to identify the various village and mound components (Figure 22). Because of their proximity and apparent cultural contemporaneity we have adopted a single designation of 1Ma31/32. The site is located on the crest of a rise that is presently in cropland and characterized by Etowah silty clay loam. As mentioned previously, the eastern end of the site is marked by a now artificially channeled stream.

Disturbance at the site has resulted from previous investigations conducted in the 1940s by Day, as well as the artificial channeling of the stream and the construction of a road that runs partially along the eastern portion of the site and divides two USGS sections.

Previous Work: From March 1940, until July 1941, excavations were conducted at site 1Ma31/32. A summary of these excavations and a detailed accounting of the results has never been published, although a thorough and concise unpublished report and meticulous field notes were prepared by the field supervisor, H. Summerfield Day (Day; n.d.a, n.d.b). The reports have been made available to the authors of this report by the Office for Archaeological Research at the University of Alabama and the Moundville Museum at Moundville, Alabama. The background data presented here, therefore, are based on the 1940s excavations and derived from Day's summary and notes unless otherwise stated.

Day referred to the site as three areas including Ma^V31, Ma^O31, and Ma^O32, with the superscripts referring to mound (^O) or village (^V) (Figure 22). All of these were located in immediate proximity to one another and apparently confined to the area west of the USGS section lines (Sec. 24 and 19). The first two were basically the mound and village components of a single site. The mound, Ma^O31, was described as being small, about 1.5 m (4 ft) high and nearly circular with diameters of 12 m north-south by 10.6 m east-west (40 by 35 ft) (Plate 15). Three stratigraphic zones were recognized in excavations of Ma^O31, with Zone A being a reddish, mixed soil that contained the majority of the artifacts recovered from the mound excavation. Zone B was described as a grayish-yellow-to-white-colored clay that included numerous tiny nodules of manganese. Only a small percentage of the cultural materials in the mound were recovered from this zone, leading Day to suggest that, although the two zones (A and B) are culturally and chronologically identical as they occurred in the mound, the white clay may have contained non-related materials that were deposited before the dirt was brought to the mound. The third zone, C, was the underlying village level that was present before construction of the mound.

The excavations revealed evidence of four burials, one of which consisted of a flexed skeleton that, although not in good condition,

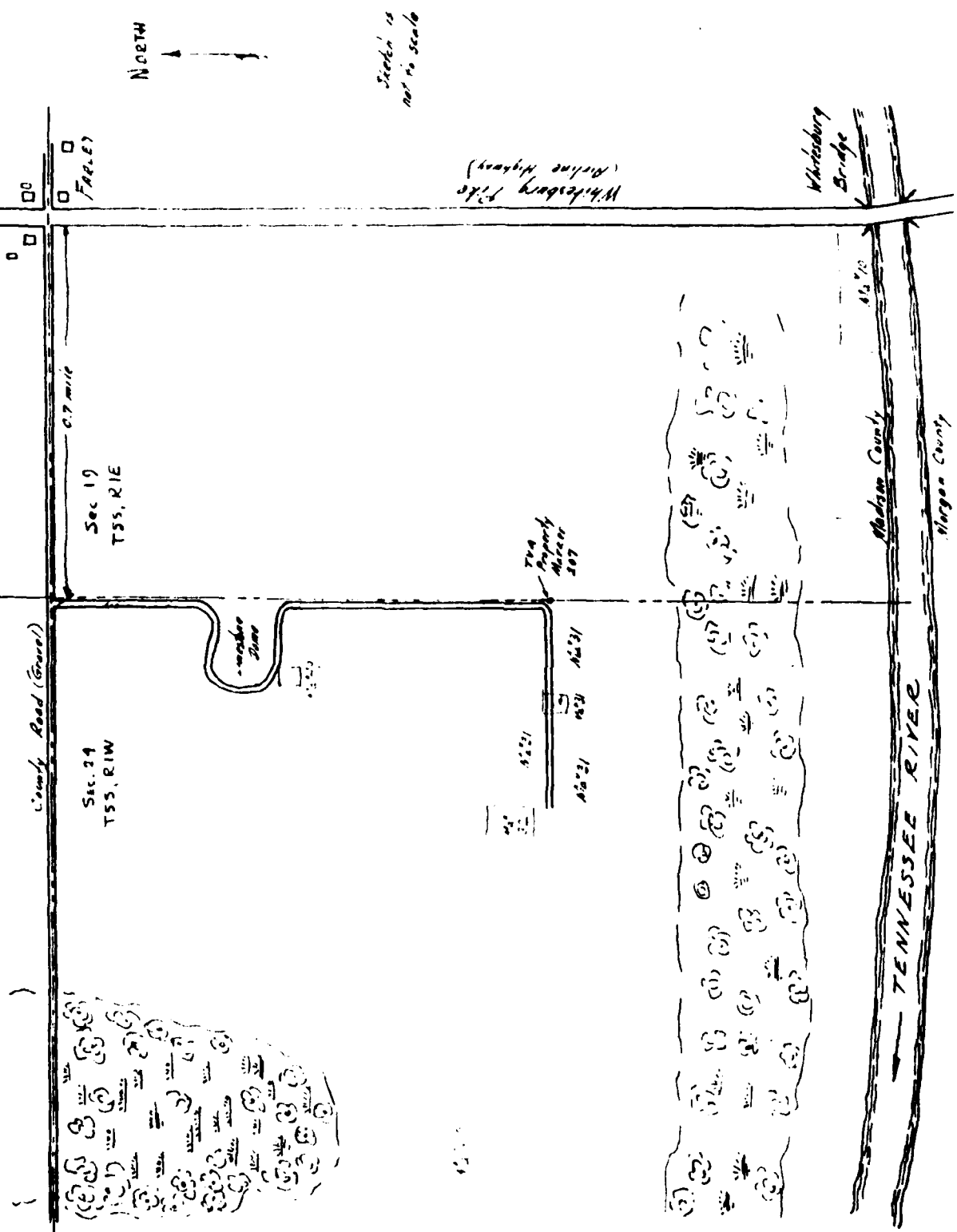


FIGURE 22. 1941 SKETCH MAP OF SITES 1Ma31, 32, 33, 49, and 50 PREPARED BY H. SUMMERFIELD DAY (n.d.a:2)
COURTESY OF THE OFFICE FOR ARCHAEOLOGICAL RESEARCH, MOUNDVILLE, ALABAMA.

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PLATE 15. IMA⁰31 MOUND PRIOR TO 1940 EXCAVATION AND CLEARANCE.
IMA⁰32 TO THE LEFT REAR OF THE IMA⁰31 MOUND. Photo
Courtesy of the Office for Archaeological Research,
Moundville, Alabama.

was the best-preserved of the group. It was found in Zone A, along with two shell-tempered vessels next to the left shoulder of the skeleton. One of the vessels was a plain water jar that Day described as similar to a vessel from Hobb's Island. The second vessel was a broken bowl with punctate designs on the neck and shoulder. This vessel was similar to one recovered from Hobb's Island. Burials 2 and 3 consisted of skull vaults only, also found within Zone A. A small, shell-tempered ceramic bowl was a probable association with these skulls. Finally, Burial 4 was found about 7.6 centimeters (three inches) below the surface in both Zones A and B. It was represented only by bone dust and teeth caps. Day suggested this burial was intrusive into the mound after the primary occupation.

The only other feature encountered in the mound excavation was a circular house pattern, defined by eleven post molds. This structural pattern was found at the base of the mound, originating in Zone C. Day concluded that the circular structure was erected prior to mound construction and might have represented a ceremonial structure, over which the mound was deliberately built.

In addition to the pottery described above, Ma⁰31 yielded a human effigy clay pipe depicting a kneeling figure holding a bowl which forms the pipe bowl. The figure's head was broken, and not recovered in excavation. Also found in Zone A were two copper buttons that were probably associated with a cache of nine small, triangular Mississippian-type projectile points, a bone object, and a stone object. Near the bottom of Zone A, where it penetrated into Zone C, was a stone discoidal. Isolated artifacts also included projectile points, a few scrapers, and a drill.

The second site, Ma^V31, was a presumed village area, surrounding Ma⁰31, and to the east of Ma⁰32. Day described the village as comprising some 305 meters (1000 ft) east-west, and at least 61 meters (200 ft) north-south, although he notes that burials and surface findings outside these limits indicate the village probably extended much farther to the north. The excavations, confined to the area designated above, employed 1.5 meters (five-foot) trenches at varying intervals to locate structural features (Cover Plate and Figure 23). Two levels were identified in the excavations, consisting of an upper plow zone containing mixed material, and an underlying "below plowed zone," which, Day states, contained undisturbed cultural debris from "continuous occupation over an indefinite period of time" (Day n.d.a:7).

Interestingly, Day notes that surface indications of the village were very sparse, and included only occasional "flint specimens." Potsherds were almost completely absent on the surface, and, in general, were not recovered in abundance in any areas of the site, even in those which were excavated.

There is, however, no question that the site represented a village, as evidenced by the exposure of twenty-one rectangular

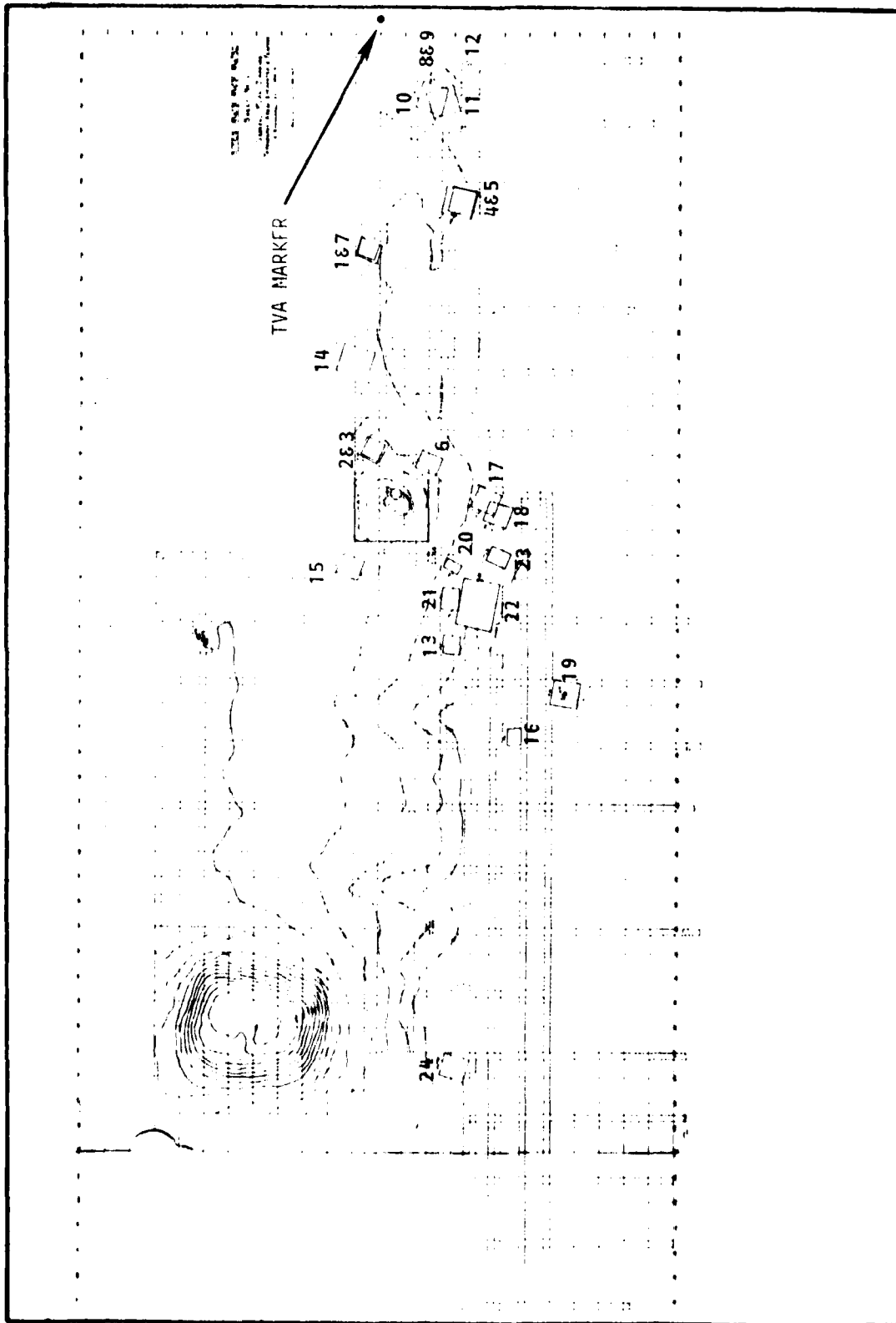


FIGURE 23. 1941 EXCAVATION MAP OF SITES 1Ma31 AND 32 SHOWING LOCATION OF FEATURES. Note location of TVA marker in right center of figure and compare it to the same marker in FIGURE 22. Courtesy of the Office for Archaeological Research, Moundville, Alabama.

structural patterns, all but two of which were oriented in a northeast-southwest direction (Figure 23 and see Appendix I for detailed maps of each Feature). Day notes no arrangement to the structures that might indicate a village street; however, because of the overlapping character of the patterns, it was apparent that no more than fifteen could have existed at any one time. The patterns appeared to represent dwellings, except for structures 20 and 22, both of which were distinguished from the others by their relative size. Feature 20 was the smallest structure, measuring 2.4 meters by 4.6 meters (8 by 15 feet), while Structure 22, located nearby, was the largest, at 11.5 meters by 8.9 meters (38 by 29 feet). Day suggested that the larger structure might represent a lodge, or "community center," with the smaller representing some associated outbuilding. He notes that the larger structure, Structure 20, lacked a fire pit, and, because the floor lay deeper than the plowzone, it is improbable that a fire basin was present then subsequently destroyed by historic farming activities.

Of the remaining structures, all but seven contained fire pits; center posts, presumably for roof support, were found in five. One Structure, Structure 5, showed evidence of repair or reinforcement in partially doubled north and west walls. In Structure 13, a slight ramp was noted, that might have served as an entrance doorway. Day also states that "breaks at the corners of other houses, usually on either the south or east side, may indicate the entrances for those structures" (Day n.d.a:10).

Other distinctive finds were found in Structure 16, where two construction techniques were noted. The north and south walls of that structure were erected by digging a trench, then placing posts in the trench. The east and west walls, however, had posts set without a trench. This structure also showed the only evidence of a center partition, consisting of a series of three post molds aligned east-west, apparently dividing the house into two parts.

Within Structure 19 a flexed burial in a poor state of preservation was found. Three other fragmentary burials were found about 36.6 meters (120 feet) from Structure 15. Two of these were adults, and one was an infant or child. Parts of broken pottery vessels were found with two of the burials.

As mentioned above, ceramics were relatively infrequent at Ma^V31, especially when considered in the light of the number of structures uncovered. In all, the ceramic collection consisted of 3,800 shell-tempered sherds, and four broken shell-tempered pottery bowls. Stone tools included projectile points (frequently broken), a few scrapers and hammerstones, but, in general, artifacts of this material category were sparse. Bone, shell, or copper artifacts were completely absent.

Day concluded that this site represented the supporting village for both the small mound, Ma^O31, and the larger mound, Ma^O32, to be

discussed below. His general opinion, based on the arrangement of the structural patterns and the shell-tempered ceramics, was that the site represents a Mississippian occupation.

The third component of 1Ma31/32 was originally designated Ma032. As originally reported in 1933 by Jones and Hay (Plate 16), it was described as a large mound. They commented that it was covered " ... with trees. 10' high; oblong 75' x 105'. No previous excavation evident. Probably nothing to be found. Nothing collected" (Day n.d.a:13). In 1940, Day returned to begin excavations at the mound that had previously been cleared at the end of 1939. His impression was totally different from that of Jones and Hay, and is best illustrated in his report by the following comment: "The mound was a dominating feature of the landscape, and was almost certainly the focal point of the aboriginal occupation in the vicinity" (Day n.d.a:13).

He also noted that there was evidence of disturbance caused by "treasure-seekers" who had dug numerous pits into the top level of the mound (Figure 24). Excavation began on the mound by running a trench on the east side of the mound, and continuing vertical slicing from that point (Plate 17). Balks (referred to as "trailers") were left unexcavated for profile inspection. The profiles made it apparent that an unusually complicated condition of loading was present, so a decision was made to abandon the technique of vertical slicing for horizontal cutting, which would reveal house floor levels (Plate 18).

The horizontal excavations uncovered thirteen structural remains that were apparently erected over an extended period of time (Figure 25). At the base of the mound was a circular postmold pattern and a line of smaller posts, that may have represented part of a rectangular structure. Also at this level the largest structural pattern was uncovered. It was rectangular in shape, and measured 11.9 meters by 8.5 meters (39 by 28 feet) between the walls, revealing a well-preserved hard clay floor. The floor, according to Day, had been resurfaced two or more times. The wall posts in this structure were quite large, and a deep hole in the center revealed the former location of a center roof post, that had been removed after the structure was abandoned. Adjacent to the large hole left by aboriginal removal of the center post was a raised rectangular hearth that had been destroyed in the center post excavation (Day parenthetically suggests that this might be an altar, instead of a hearth). In addition to these somewhat distinguishing features, this structure had interior partitioning that included two interior corner postmolds which appeared to have held dressed posts.

In the south side of the mound base, a roughly square structure was found that exhibited interior postmold patterns, possibly suggesting partitions, such as those in the larger structure above, and that found in the village area. The posts in this structure were entrenched, and the floor was hard-packed clay.



PLATE 16. 1MA⁰32 MOUND PRIOR TO EXCAVATION. LOOKING NORTH-EAST. Courtesy of the Office for Archaeological Research, Moundville, Alabama.

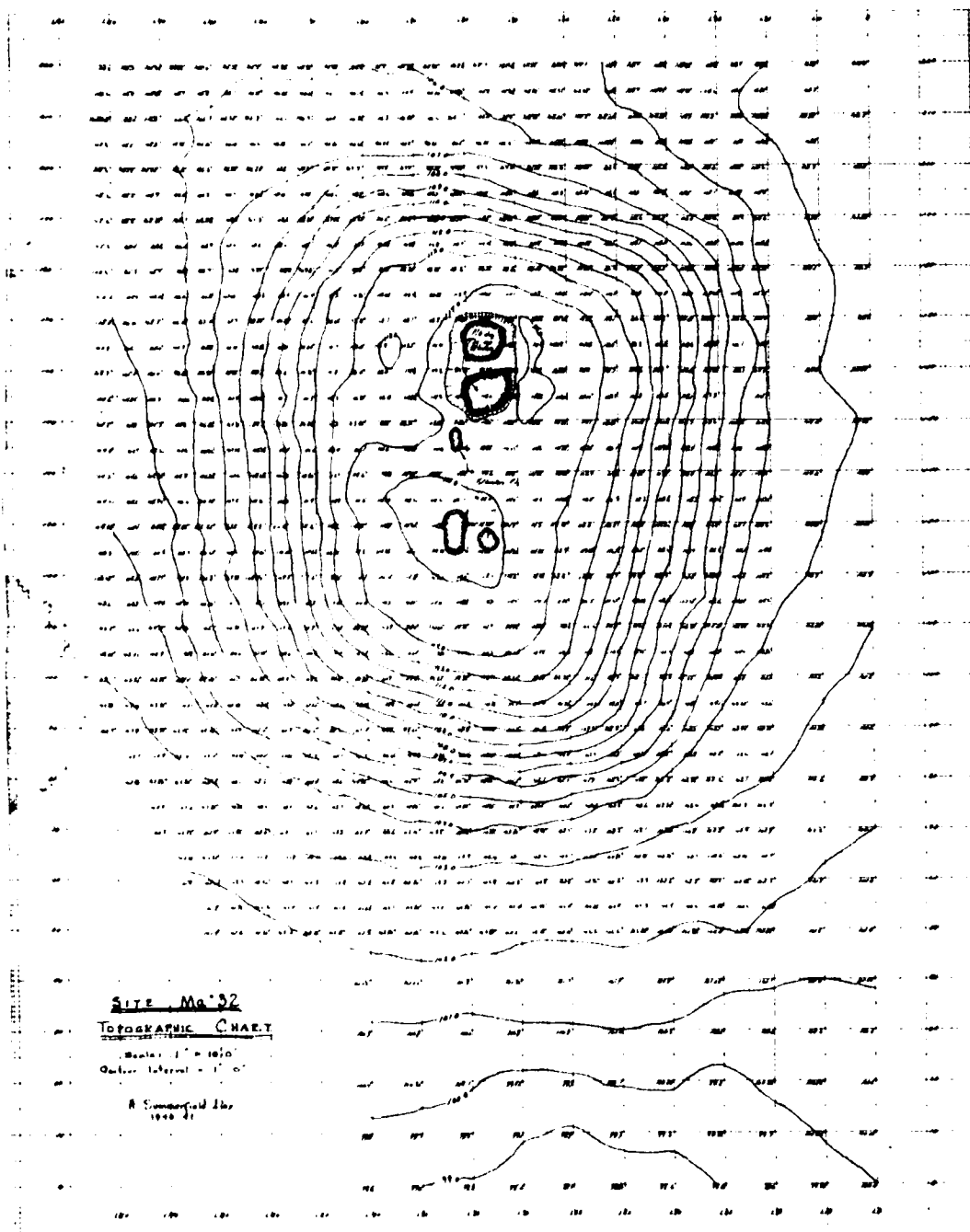


FIGURE 24. 1941 CONTOUR MAP OF MOUND 1Ma32. Note the "treasure-seekers" pits in the center of the mound. Courtesy of the Office for Archaeological Research, Moundville, Alabama.



PLATE 17. 1MA⁰32 MOUND AT THE CONCLUSION OF THE FIRST STAGE OF EXCAVATION. VARYING LEVELS REPRESENT DIFFERING OCCUPATION AND BUILDING STAGES. Courtesy of the Office for Archaeological Research, Moundville, Alabama.



PLATE 18. 1MA032 MOUND LOOKING ALMOST DIRECTLY EAST. EXCAVATION STRATEGY INVOLVED STRIPPING OF BUILDING LAYERS. Courtesy of the Office for Archaeological Research, Moundville, Alabama.

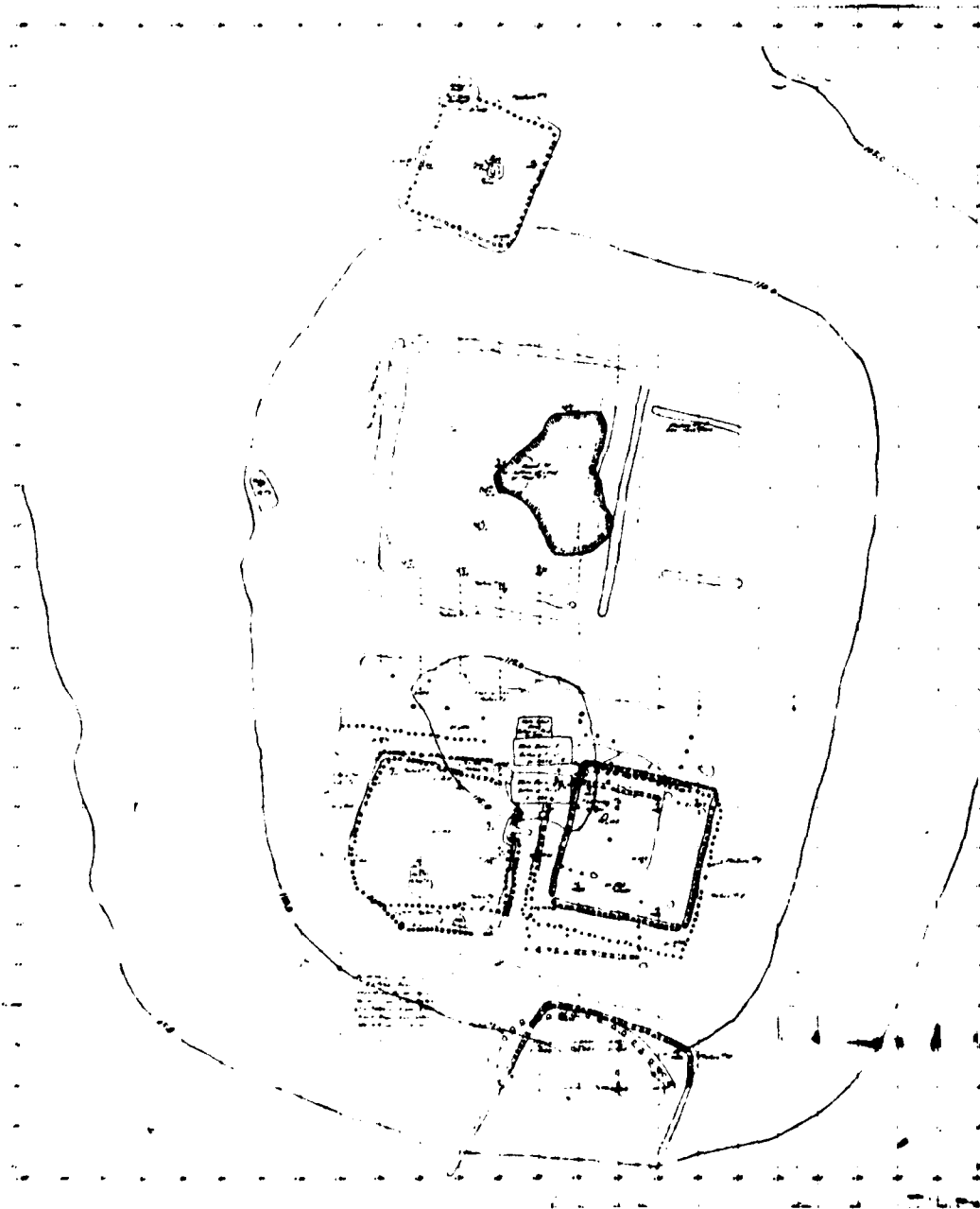


FIGURE 25. 1941 MAP OF EXCAVATED MOUND 1Ma32 SHOWING LOCATION OF FEATURES AND STRUCTURAL PATTERNS UNCOVERED AT THE BASAL LEVEL. Courtesy of the Office for Archaeological Research, Moundville, Alabama.

On the north side of the mound, a roughly square house pattern was found, with postmolds and a central fire basin that intruded into the undisturbed red clay underlying the mound. There was no question but that this structure represented a pre-mound construction very similar to those excavated in the village area, MaV31. Day suggested that this structure be more appropriately considered as part of the village, rather than a construction stage of the mound.

The remaining nine structures were located variously within the unspecified number of levels of the mound, and, in some cases, overlapping and intruding into each other (Day n.d.a:13-21).

Two aboriginal burials were recovered from the excavations, with one in association with two of the upper structural remains. It was in a poor state of preservation, but what remained showed the individual to have been interred in a flexed position with the legs crossed at the knees. The second burial, which was not discussed beyond a brief mention, was found in a deep pit, clearly in a pre-mound context. In addition to the aboriginal burials, three non-aboriginal burials were found in graves about six feet beneath the mound summit. These included one adult male, one adult female, and an infant, who had been interred in wooden caskets that had since disintegrated. Identifying marks were the initials R. B., formed by the brass nails left in the coffin remains of the adult male.

Day's general observations on the mound focused on the method of construction that utilized several different kinds of clay, giving rise to a complicated loading situation. Much of the mound was constructed of the typical red clays found in the surface soil of the floodplain. However, there were masses of a yellowish-to-light-gray clay that contained tiny particles of manganese. Although Day does not discuss the comparison, this clay is very similar to that he reported as Zone B of the mound at Ma031 (see above). Evidence of basket loading was apparent throughout much of the mound fill. Day notes that the main axes of the mound and the structures uncovered were all oriented in roughly the same directions, and corresponded to the orientation of the structures excavated in the village area. Of all thirteen structures, only one, Structure 3, which was definitely an occupation precedent to the mound construction, contained a fire basin. He concludes that the absence of fire basins suggests the mound structures were erected for purposes other than residential dwelling. The artifacts found included shell-tempered ceramics and stone projectile points and scrapers, the tool artifacts comprising ninety per cent of the collection. He notes that the artifactual inventory was, by comparison, small in relation to the size of the mound. Two unusual artifacts were a mica fragment and a small cube of galena, but no information was provided as to their provenience.

Day's report on this site, 1Ma31/32, suggests the presence of a Mississippian village that surrounded a small mound, lying to the east of a large ceremonial mound, which he considered the focal point of the occupation. Although the data clearly suggest a Mississippian

occupation, the relative paucity of artifacts, in view of the number of burials, structural remains, fire pits, and presence of two mounds, is difficult to explain. Plate 19 shows the area which once encompassed Mound 1Ma32. No attempt was made by Day to reconstruct the mound after it had been completely excavated. As will be discussed in the following section the complete removal of the mound material made relocating its exact position somewhat difficult.

Current Work: The initial stage of our investigations conducted at 1Ma31/32 consisted of the relocation of the site area as originally defined by Day (Plates 20 and 21). In both his field notes and final summary report, Day indicated that 1Ma32/32 was situated almost due west of TVA marker 207 (Day n.d.a), and that the combined site area was 305 meters (1000 feet) east-west, and 61 meters (200 feet) north-south. Careful reconnaissance of the site area, based both on Day's sketch location map (Figure 22) and on the placement of the site on University of Alabama-supplied site location maps, indicated that Day had, apparently, misread the TVA marker designation, since the only such marker in the vicinity of the site is Number 205. In addition, the original size estimate of the site appeared to be conservative, with the total area of the combined sites being substantially larger than indicated by Day. A third problem resulted from the planting of additional forest south of Day's primary east-west baseline, thereby obscuring almost one-half of the site area as he originally defined it. Finally, the mounds at both 1Ma31 and 1Ma32 no longer exist, primarily from a combination of the earlier excavation, and, since that time, cultivation.

The majority of our work conducted at the site focused on areas north and east of Day's primary baselines and west of TVA marker 205. As noted, to the south the site area is now heavily wooded, and, as the majority of Day's excavations were conducted in that area, no further work was instituted. To the west, the boundary between 1Ma31/32 and 1Ma33/50 is indistinct, therefore, no formal division between the two site complexes was made at the time of the transect surveys of the areas. Since Day found chronological differences between these sites, it was hoped that the results of the transect survey would indicate a noticeable break between the two. It should be noted that the eastern area of the site, lying northeast of the TVA marker, has been heavily impacted by fill-removal operations (Plate 21); therefore, the configuration of the eastern portion of the site (Figure 26) is probably not representative of the actual site size or shape.

A series of eighty-one transects, spaced at 15-meter (49 feet) intervals was placed west-to-east across the area of the complexes. Each transect, oriented north-south, conformed in length to the width of the field area, though transects were extended in the western section of the area into the treeline, where shovel pitting was conducted. The division between 1Ma31/32 and 1Ma33/50 was made on the basis of artifact concentrations. An arbitrary division in the low density area at 275 meters (902 feet) west of the TVA marker 205 was selected and

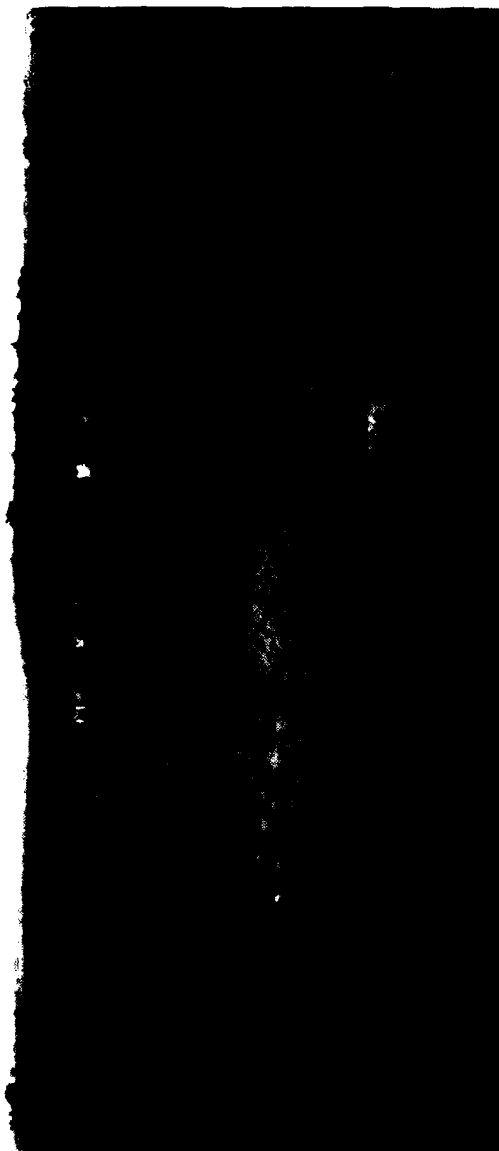


PLATE 19. 1941 PHOTOGRAPH SHOWING THE EXCAVATED AREA WHICH HAD ONCE ENCOMPASSED
MOUND 1Ma32. Courtesy of the Office for Archaeological Research,
Moundville, Alabama.



PLATE 20. 1MA31/32 LOOKING NORTHWEST WITH THE EASTERN PORTION OF THE SITE THE LIGHTER FIELD IN THE FOREGROUND. THE DARKER PINE STAND IN THE UPPER LEFT IS THE VICINITY OF THE 1941 H. SUMMERFIELD DAY 1MAV31 EXCAVATIONS.



PLATE 21. 1MA31/32 EASTERN SECTION IN THE MIDDLE FOREGROUND. LOOKING SOUTH TOWARD THE TENNESSEE RIVER.

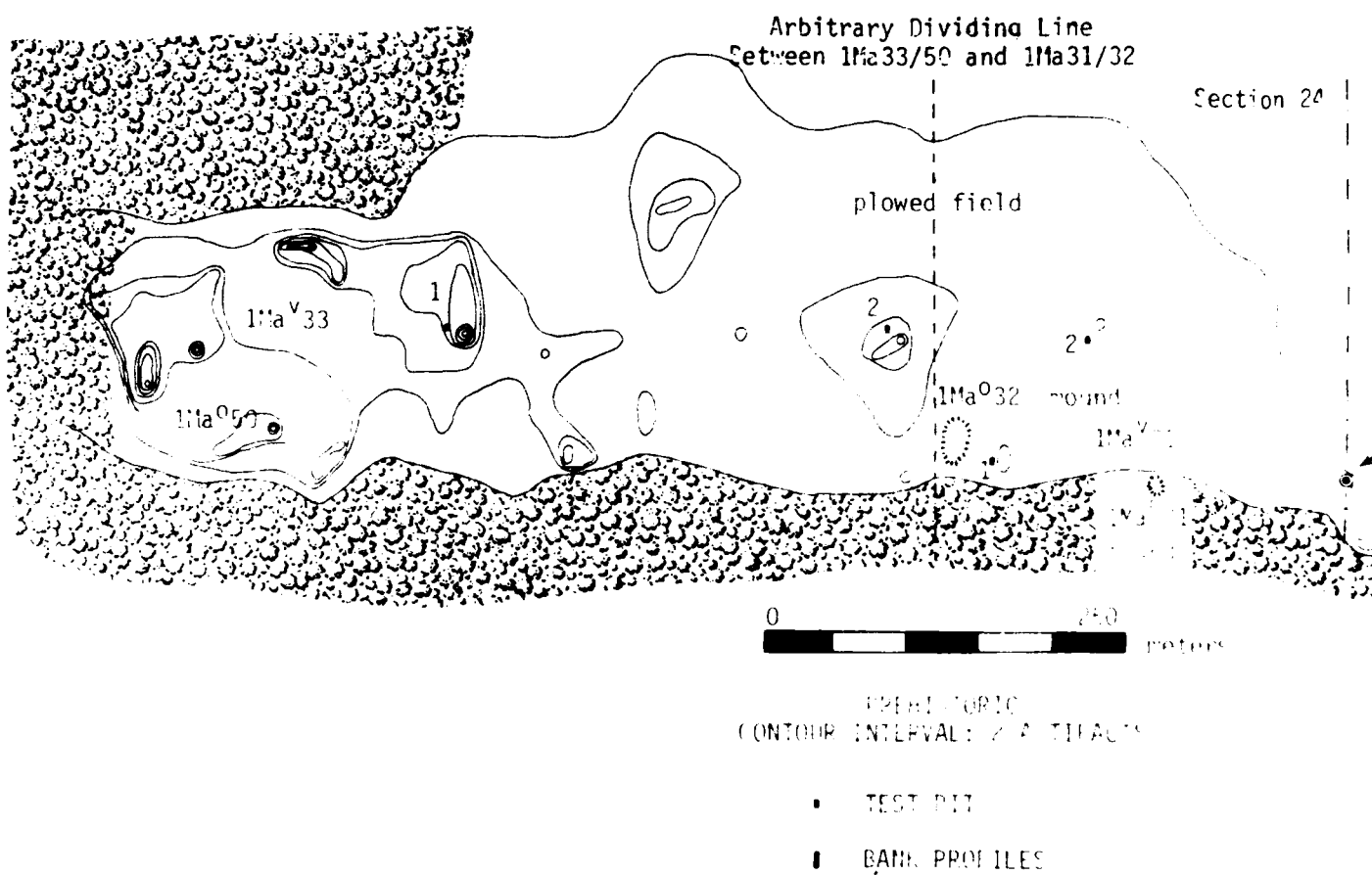


FIGURE 26. FREQUENCY CONTOUR MAP OF 1Ma³³¹ (village), 1Ma³³¹ (mound), 1Ma³³² (mound). Site designations from H. Summerfield Day-1941. Note that the area east of TVA Marker 207 on the 1941 sketch map-see Figure 26) was not excavated in

dina Line
and 1Ma31/32

Section 11 Section 19

field



DISTURBED AREA

Top of Mound Marker 205

2 foot bar

EASTERN PORTION OF 1Ma31

not excavated by the team in 1961

1Ma31 mound

1Ma32

0 10 20 meters

1Ma⁰31 (mound), 1Ma⁰32 (mound), 1Ma⁰33 (village), and 1Ma⁰50.
1. Note that the area east of TWA marker 205 (referred to as
June 26) was not excavated in 1961.

all materials lying to the east of this line were grouped as site 1Ma31/32, and all those to the west as site 1Ma33/50. Site 1Ma31/32 extends for 800 meters (2624 feet) east of this point and, as can be seen in Figure 26, high-density concentrations were confined to the eastern portion. The highest frequency in any one collection square was thirty-five artifacts. Transects were terminated at the eastern most end of 1Ma31/32, despite consistent high frequencies, because of an abrupt drop-off, and the presence of a wide drainage ditch, which appeared to act as drainage for a series of holding ponds to the southeast.

The results of the transect survey of the site area indicated that the area north of the WPA excavations displayed a consistently low surface density. Day also reported little in the way of surface artifactual material, and comments, in his notes, that the majority of material that was spotted consisted of flaking debitage and isolated pieces of ground stone (Day n.d.b). Apparently, Day did not conduct any systematic or non-systematic reconnaissance to the east of the section road; therefore, there were no existing data concerning the surface conditions or artifact assemblage for the extreme eastern section of the site prior to our investigations.

The position of the western section of the site just north of the Day excavations dictated the placement of two test units in that area, in an effort to define the presence of village extensions north of the village area excavated by Day. In addition, three bank profiles were cut along the north-facing slope of the eastern section of the site, as opposed to a formal test pit, in order to define the stratigraphic sequence of the extension. The slope is formed by the gravel and fill removal to the north, and the partially slumped profile is approximately two meters (6.5 feet) wide in the western half of the area, decreasing to a height of approximately one meter (3.28 feet) in the extreme eastern half of the section. Even with clearance, the slump did not allow for the development of a continuous vertical profile, and each of the profiles was excavated into the bank, using a stepping procedure. Fill was removed as a whole, as the information being sought was primarily the relationship of the stratigraphic levels to the profiles exposed in Test Pits 1 and 2.

Current Results: Test Pit 1, located to the north of Day's excavation in the low-surface-density area, was excavated in three and one-half 10 centimeter arbitrary levels to a depth of 35 centimeters (13.8 inches) below present ground surface. A possible feature was identified in the third arbitrary level and north profile, and excavation continued in one-quarter of the unit for another 55 centimeters (21.7 inches) below the unit bottom, in order to define the nature of the feature. Two distinct strata were identified in the unit. Stratum 1 is a 7.5YR 4/4 sandy clay loam plowzone, slightly browner than dark brown. The stratum averages 20 centimeters (7.9 inches) in thickness, and the upper portions have been heavily disturbed by plowing. All artifacts recovered from the unit came from Stratum 1, or were confined to the contact zone between Strata 1 and 2. Stratum

2 is a sterile reddish-brown (5YR 4/4) silty clay loam. The possible feature was first exposed in the north profile of the unit, at the contact line between Strata 1 and 2. Fill within the feature was a dark reddish-brown, slightly sandy silty clay loam, with minimal charcoal flecking. The northern quarter of the test pit was excavated in order to expose the full section of the feature. It was apparent that the feature was a well-defined tree root mold, and not a postmold.

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. The stratigraphic profile is virtually identical to that of Test Pit 1, even though Test Pit 2 was slightly higher in elevation than the former. All artifactual material recovered from the unit came from Stratum 1.

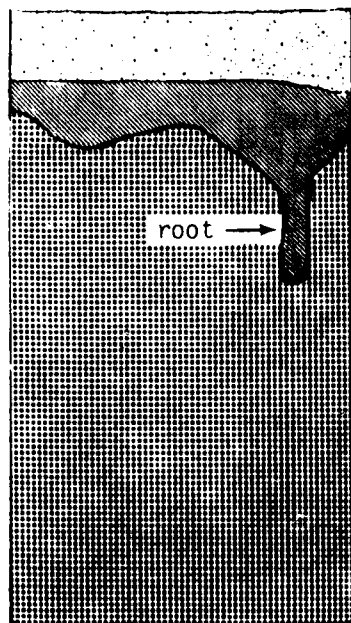
Profile A was excavated to a depth of 1.8 meters (5.9 feet) below present ground surface (Figure 27). Three distinct strata were defined in the profile. Stratum 1 is a dark yellowish-brown (10YR 3/4) silty clay loam plowzone, approximately 20 centimeters (7.9 inches) in thickness. A transition zone, designated Stratum 2, separates the plowzone from the completely undisturbed B horizon (Stratum 3). Stratum 2 is a reddish-brown (5YR 4/4) silty clay loam, which, as illustrated in Figure 27, has been disturbed by roots. The underlying B horizon is a dark-red (2.5YR 3/6) silty clay loam which shows no disturbance.

Profile B, located at the extreme eastern end of the profile cut, was excavated to a depth of 70 centimeters (27.6 inches) below present ground surface (Figure 27). Three distinct strata were defined in the profile. Stratum 1 is a dark yellowish-brown (10YR 4/6) silty clay loam plowzone. Stratum 2 is again, as with Profile A, a transition zone, and is a yellowish-red (5YR 4/6) silty clay loam. The underlying Stratum 3 represents the B horizon, and is a strong brown (7.5YR 5/6) silty clay loam.

Profile C is situated midway between Profiles A and B, and was excavated to a depth of 80 centimeters (31.5 inches) below present ground surface (Figure 27). Four strata were defined in the profile, with the basis for distinction in the lower three strata basically a slight differentiation in coloration. The upper Stratum 1 plowzone is approximately 30 centimeters (11.9 inches) deep, and is a dark yellowish-brown (10YR 3/6) silty clay loam. Two transition zones, Strata 2 and 3, separated the plowzone from the B horizon. Stratum 2 is a dark-brown (7.5YR 4/4) silty clay loam, with a clay content slightly higher than that of Stratum 1. Stratum 3 is similar in clay content to Stratum 2, though it is a dark yellowish-brown (10YR 4/4) mottled, silty clay loam. The B horizon is an undisturbed, yellowish-brown (10YR 5/8) silty clay loam.

The results of our investigations at this site indicate evidence of activity in the Paleo-Indian, Early Archaic, Middle Archaic (single diagnostic), Late Archaic, Late Woodland and Historic Periods (Plates 22, 23 and 24). Our data were somewhat surprising in light of Day's

PROFILE A



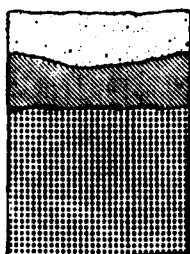
1Ma31

BANK PROFILES

- Dark Yellowish Brown, 10 YR 3/4, Silty Clay Loam
- Reddish Brown, 5 YR 4/4, Silty Clay Loam
- ▣ Dark Red, 2.5 YR 3/6, Silty Clay Loam

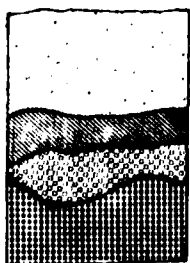
20 cm

PROFILE B



- Dark Yellowish Brown, 10 YR 4/6 Silty Clay Loam
- Yellowish Red, 5 YR 4/6, Silty Clay Loam
- ▣ Strong Brown, 7.5 YR 5/6, Silty Clay Loam

PROFILE C



- Dark Yellowish Brown, 10 YR 3/6, Silty Clay Loam
- Dark Brown, 7.5 YR 4/4, Silty Clay Loam
- ▣ Dark Yellowish Brown, 10 YR 4/4, Silty Clay Loam with Dark Brown Mottling
- ▣ Yellowish Brown, 10 YR 5/8, Silty Clay Loam

FIGURE 27. BANK PROFILES AT SITE 1Ma31.

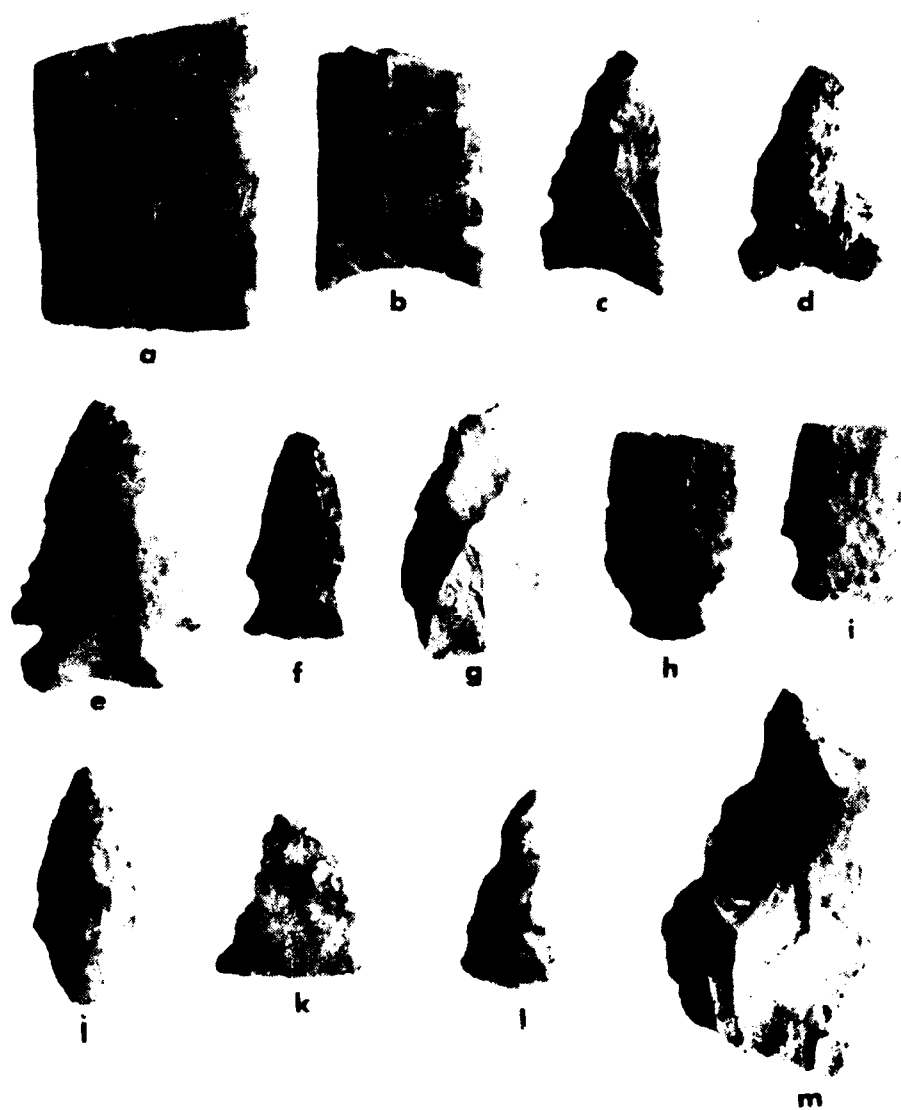


PLATE 22. LITHIC ARTIFACTS FROM 1MA31/32; a, Milnesand variant (large); b, Redstone variant; c and d, Big Sandy; e, Decatur; f, Swan Lake; g, Flint Creek; h and i, Type 98-99 (Faulkner and McCollough 1973); j, Flint River Spike; k, Brewerton Eared Notched; l, Awl; m, Punch/graver.



PLATE 23. LARGE BIFACIAL BLADE FROM 1Ma31/32.

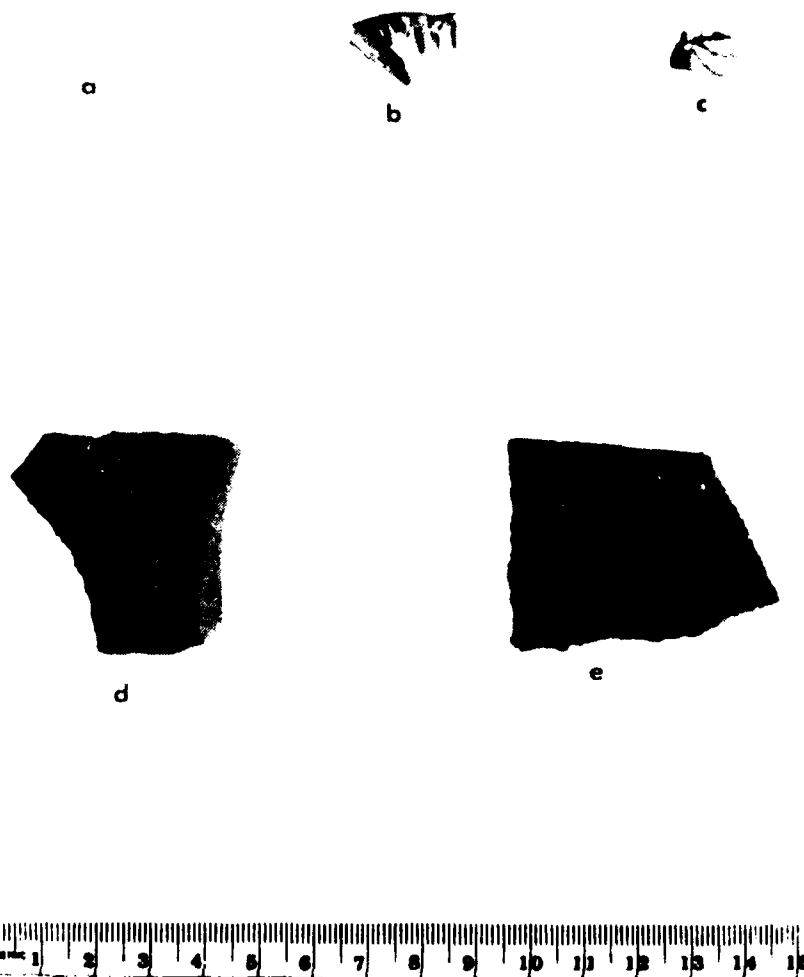


PLATE 24. HISTORIC CERAMICS FROM 1Ma33/50 and 1Ma31/32.
a, Undecorated Pearlware fragment; b, Whiteware
fragment, Blue Shell-Edged; c, Ironstone frag-
ment, Polychrome; d, Stoneware fragment, Salt
Glaze; e, Stoneware fragment, Lead Glaze.

earlier excavation results. His work uncovered a Mississippian village with associated mounds, however we found no evidence of Mississippian artifacts, unless the two McKelvey Plain sherds represent a continuation of this type into the Mississippian (Table 8). We do not feel that our data contradict that of Day, but rather augment his work since we focused our attention east and north of his excavations. It appears that this site was the locus of lengthy prehistoric occupation, but reached its peak during the Mississippian Hobbs Island period. Day's extensive excavation has virtually removed all evidence of this well-defined Mississippian occupation.

1Ma33/50: Archaeological Investigations

As was the case with 1Ma31/32, this site was considered by H. Summerfield Day as two separate sites (Figure 26). The site, 1Ma33/50, lies to the west of 1Ma31/32 on a terrace of the Tennessee River. The mound portion (originally designated Ma⁰⁵⁰) is situated in a wooded area, while the village (originally Ma^{V33}) is in a plowed field. Some disturbance has resulted at the site from plowing activities and erosion.

Previous Work: Jones and Hay, in 1933, first recorded Ma^{V33} as a "village extending 1/2 mile due W from Mound A [Ma⁰³¹] 200' wide by 2500' long" (Day n.d.b). Unfortunately, the record of investigations undertaken at Ma^{V33} is less complete than for other sites investigated by Day; however, pertinent information can be obtained from brief notes in the excavation record he kept while at 1Ma31/32 and the final report on Ma⁰⁵⁰ (Day n.d.b; n.d.c). It appears that Day first encountered the site while investigating an area west of Ma⁰³² (the large domiciliary mound). A few postmolds were revealed, so he began cutting farther west, and encountered a floor of hard-packed clay. Since it was outside the limits of the mound at Ma⁰³², he designated the area site 1Ma33. Apparently, from his excavation record, intensive investigation was not undertaken at this site although some work progressed concomitant with the excavations at Ma⁰³². Day was able to trace the house pattern from where it was first exposed to the edge of a plowed field. Since he did not have permission to continue he ceased work at the field boundaries.

Work was, however, undertaken at the mound (Ma⁰⁵⁰), which is located about 610 meters (2000 feet) west of Ma⁰³². He noted that erosion had altered the original configuration of Ma⁰⁵⁰. At the time of his excavations, Day describes the mound as "conoid" in shape, although he felt it was originally a rectangular configuration. The measurements were 36.6 meters (120 feet) in diameter, and 1.4 meters (4.5 feet) high.

His excavations included the placement of a series of 1.5-meter (5-foot) trenches through the mound, which were carried to sterile subsoil. Four stages of mound construction were determined by the excavations. The earliest stage, represented as Fill 1, was a red clay that was piled directly on top of the old humus zone underlying

TABLE 8. ARTIFACTS RECOVERED FROM 1Ma31.32.

	Surface, Radials, & S. P.	I.P. 1	I.P. 2	Totals
CERAMICS				
McKelvey plain	2			2
O'Neal plain	1			1
Total	3			3
LITHICS				
Chipped stone				
Primary form	2			2
Flakes, unmodified				
Primary	25			25
Secondary	31			31
Tertiary	286	3		289
Flake frag., unmodified				
Primary	16			16
Secondary	25			25
Tertiary	461	6		467
Debris, unmodified	158			158
Flakes, modified				
Primary	5			5
Secondary	5			5
Tertiary	7			7
Flake fragments, modified				
Primary	1			1
Tertiary	6			6
Debris, modified	1			1
Core, unmodified	40		1	41
Blade	3			3
Unifacial tools				
Domed scraper/chopper	3			3
Transverse scraper	2			2
End scraper on flake	3			3
Denticulate flake	2			2
Notched flake	1			1
Awl	1			1
Graver	1			1
Bifacial tools				
Large flat ovate	2			2
Graver	1			1
Small flat ovate	4			4
Unid. frag., no apparent usage	7			7
Knife fragment	8			8
Preform	2			2
Back side scraper	6			6
Punch/graver	3			3
Unid. frag., scraping use	14			14
Ovate to elongated	2			2
Flaked end scraper	1			1
Projectile points				
Milnesand	1			1
Paleo-formerly Redstone	1			1
Decatur	1			1

Unid. frag., no apparent usage	7	7
Knife fragment	8	8
Preform	2	2
Back side scraper	6	6
Punch/graver	3	3
Unid. frag., scraping use	14	14
Ovate to elongated	2	2
Hafted end scraper	1	1
Projectile points	1	1
Milnesand	1	1
Paleo-formerly Redstone	1	1
Decatur	1	1
Swan Lake	1	1
Gary	2	2
Big Sandy	2	2
Type 98-99 (Faulkner and McCollough 1973)	1	1
Flint Creek	1	1
Brewton-Earnotched	1	1
Flint River Spike	1	1
Whole unid.	5	5
Knife/proj. pt. frag.	7	7
Groundstone		
Battered pebble <64mm	5	5
Small battered cobble	5	5
Large battered cobble	3	3
Battered pebble/small cobble fragment	7	7
Unmod. river cobble	5	5
Mortar fragment	3	3
Battered pitted cobble	2	2
Mano on battered cobble	1	1
Sm. frag. w/abraded surface, unid.	1	1
Total	1,191	1,201

HISTORIC

Glass		
Unid. clear glass bottle	2	2
Ceramic		
Stoneware lead glaze	1	1
Total	3	3

the mound. No architectural patterns or features were found in this level; however, Day does note that the midden associated with MaV33 underlies the humus level beneath the mound. Fill 2, a yellowish clay, was directly above Fill 1, and represented the second stage of construction. In this fill, a fireplace and portions of two structures were uncovered, but no artifactual material was found. Fill 3, a reddish-brown clay loam, produced evidence of two house patterns, as well as burned clay floors. The last construction stage, Fill 4, apparently produced no additional structural remains or features.

As mentioned previously, the information available on Day's excavations at this site is very limited. However, several points do appear clear with regard to the relationship of the mound to the village, the stages of construction, the dates of occupation, and, possibly, the mound function. The village area surrounded the mound, in a general northeast-southwest direction. From maps and verbal descriptions, there appears to be some discrepancy as to the distance between the village and mound; however, this may result from his having to cease excavations in the plowed field near Ma032 because of ownership permission. He classifies the village as being Woodland. The excavations in the old humus level beneath the mound bear this out, with recovery of exclusively Woodland ceramic types that include McKelvey Plain, Mulberry Creek Plain, Flint River Cord-Marked, among the primary types. In this zone, there was no evidence of shell-tempered pottery, and all indications suggested the midden dated to the Late Woodland period.

The artifacts recovered from Fill 3, which also produced the two structural remains with burned floors, consisted predominantly of limestone-tempered ceramics, including Mulberry Creek Plain, Bluff Creek Simple Stamped, and Flint River Cord-Marked. Sauty Check Stamped was also fairly well represented in the sand-tempered wares. McKelvey Plain was represented by only one sherd. These data strongly argue for a Late Woodland occupation in Fill 3, although it should be noted that shell-tempered ceramics are also present, and include Plain Shell and Langstone Fabric Marked.

It appears, from the general information provided by Day, that his assignment of a Woodland date, in general, for the village midden is correct. Moreover, the ceramics appear to point to the principal occupations having occurred during the Late Woodland period, in particular. The differences in the appearance of shell-tempered wares between the old humus beneath the mound, and Fill 3 in the mound proper, might suggest that that construction stage dates to the end of the Late Woodland period, and, perhaps, goes into the Early Mississippian period; alternatively, the mound itself may have been constructed subsequent to the Late Woodland occupation of the village by early Mississippian inhabitants, who obtained mound fill from the surrounding area that had been previously occupied. The absence of artifacts from Fill 2 and Fill 4 is difficult to explain, in light of this possibility.

Current Work: As noted in the discussion of 1Ma31/32, the field in which both 1Ma31/32 and 1Ma33/50 are located was treated as a continuous unit during the transect survey. The transects were numbered consecutively from 1 through 81, and were spaced at 15-meter (49 feet) intervals, with their north-south length conforming to the width of the open field. It should be pointed out that several of the transect lines were extended into the treeline in the 1Ma33/50 area. In each of these areas, shovel tests were placed along the transect line, in lieu of surface collection squares. Similar problems to those encountered in the definition of the 1Ma31/32 area were present in the 1Ma33/50 area. Because of the limited nature of the work conducted by Day in the site area, data concerning the size of the village component (1Ma33) were lacking. Although the excavation maps detailing the nature of the work conducted on the Ma⁰50 mound were relatively complete, there was no indication as to the disposal of the backfill material from the mound excavations. The western extent of the site complex, toward the Boundary Canal, was not clarified, and it is possible that it extends beyond the present canal location, into the vicinity of 1Ma140.

The transect survey indicated that the site area was much larger than stated on the original survey forms or in Day's notes (n.d.b; n.d.c). The site was defined as 540 meters (1772 feet) east-west, with a maximum north-south dimension of 240 meters (787 feet). The western portion of the site, which encompasses the Ma⁰50 mound, averages approximately 120 meters (394 feet) north-south, and is impacted by cultivation. In addition, standing water is present in some areas of the site. A depression which allows for the ponding of water is of interest, since it appears to have been constructed artificially, possibly resulting from the removal of fill material at the time of the mound construction. It is impossible to state definitively that this was the case without complete excavation of the location. Artifact densities along the transects tend to diminish toward the northern and southern peripheries of the site, and also experience a significant reduction toward the eastern border of the site, in the vicinity of the ill-defined boundary between 1Ma31/32 and 1Ma32/50. The majority of artifacts recovered (Table 9) were lithics or ground stone, though ceramics and shell were also identified. The shell was highly fragmentary, and field identification indicated that it was all apparently fresh-water mussel.

Because, during the Day excavations, the most extensive work had been conducted in the mound area, the test pits were placed in the Ma⁰33 portion of the site. Test Pit 1 was situated in a high-shell-density area, while Test Pit 2 was placed farther to the east, in a secondary high-density area.

Current Results: Test Pit 1 was excavated in four arbitrary levels to a depth of 40 centimeters (15.8 inches) below present ground surface. Two distinct strata were defined. Stratum 1 is a reddish-brown (5YR 4/4) sandy clay loam plowzone, with a maximum depth of 30 centimeters (11.9 inches). All artifacts, primarily flakes and

TABLE 9. ARTIFACTS RECOVERED FROM 1Ma33/50.

	Surface, Radials, & S. P.	I.P. 1	I.P. 2	Totals
CERAMICS				
McKelvey plain	2			2
O'Neal plain	4			4
Mulberry Creek plain	3			3
Sauty cord impressed	1			1
Bluff Creek simple stamped	1			1
Cox punctate	1			1
Total	12			12
LITHICS				
Chipped stone				
Primary form	5			5
Flakes, unmodified				
Primary	38	1	1	39
Secondary	87			89
Tertiary	300	10	6	316
Flake frag., unmodified				
Primary	20			20
Secondary	39			39
Tertiary	399	12	9	420
Debris, unmodified	291	11	6	308
Flakes, modified				
Primary	6			6
Secondary	5			5
Tertiary	7	1		8
Flake fragments, modified				
Secondary	2			2
Tertiary	3			3
Debris, modified	8			8
Core, unmodified	125	3	2	130
Core, modified	9	1		10
Blade	6			6
Unifacial tools				
Domed scraper/chopper	4			4
Transverse scraper	1			1
End scraper on flake	2			2
Side scraper	3			3
Notched flake	1			1
Spokeshave	5			5
Unid. fragment	1			1
Graver	3			3
Bifacial tools				
Spokeshave	1			1
Knife fragment	2			2
Knives	1			1
Back side scraper	8			8
Small flat ovate	3			3
Punch/graver	3			3
Ovate to elongated	1			1
Preform	1			1
Unid. frag., no apparent usage	10	2		12
Graver	12			12
Unid. frag., scraping use	19			19
Unid., w/heavier use				

2

Glass

- * T10 - Unidentified fragment with scraping use
- ** T5 - Small battered cobble >100mm
- *** Type 98-99 - Faulkner and McCollough 1973

flaking debitage, were recovered in Stratum 1. The sterile zone below the plowzone, a dark reddish-brown (2.5YR 3/4) silty clay loam, is designated Stratum 2. A close examination of the contact between Strata 1 and 2 failed to reveal any indications of postmolds or features, nor was there any discernible evidence of a midden which might have accounted for the surface shell densities.

Test Pit 2 was excavated in three arbitrary levels, to a depth of 30 centimeters (11.9 inches) below present ground surface, and two distinct strata were defined. The upper, Stratum 1, is a silty clay loam plowzone, approximately 20 centimeters (7.9 inches) in depth. As was the case with Stratum 1 in Test Pit 1, the soil is reddish-brown (5YR 4/4), and all artifacts recovered from the unit were confined to the plowzone. The underlying sterile zone is a red silty clay loam, slightly darker than 2.5YR 4/6. As with Test Pit 1, the contact line between the two strata was examined for any evidence of features or postmolds; neither was defined.

Artifactual material recovered from this site (Table 9) indicate activity during the Early Archaic, Middle Archaic (single diagnostic), Late Archaic, and Late Woodland, although there may be some evidence of a transition from the Middle Woodland into the Late Woodland (Plate 25 and 26). Our data are in agreement with Day's excavations since he points to occupation of the village (33) during the Late Woodland period. The upper strata of the mound (50) did indicate Mississippian occupation, but in this area, evidence of that later occupation was apparently confined to the mound with the supporting village being located in the area of 1Ma31/32.

1Ma140: Archaeological Investigations

This site is located in a field that has been in pasture for about forty years (Figure 28), although it has been periodically subjected to plowing and reseeding (Mose Walker, personal communication). The plowing has reduced the definition of the field slope; however, a generalized profile indicates that the field slopes upward to the east from the vicinity of the site. The slope is interrupted by slight rises, and it is on the first rise north of the swale which separates 1Ma140 from 1Ma141 that the former occurs.

Disturbance at the site may have resulted from the construction of a farm road that bisects the site's eastern boundary. In addition, there is some indication that the southern portion of the site may have been impacted by military maneuvers and associated heavy equipment. At the southern end of the field in which the site is located, military foxholes were identified at the junction of the field and the heavily wooded swale, and, immediately north of this treeline, a grader cut and backdirt pile were found.

Previous Work: The site was recorded during the 1979 survey of selected portions of Redstone Arsenal (Alexander 1979:108-109). At that time, it was identified as a moderate-sized lithic scatter,



PLATE 25. PROJECTILE POINTS FROM 1MA33/50.
a, Big Sandy; b, Stanley; c, White Springs;
d, Copena Triangular; e, Kent; f, Halifax-like;
g and h, Type 98-99 (Faulkner and McCollough
1973); i, Mud Creek; j, Gary; k, Baker's Creek
variant, similar to Steuben.

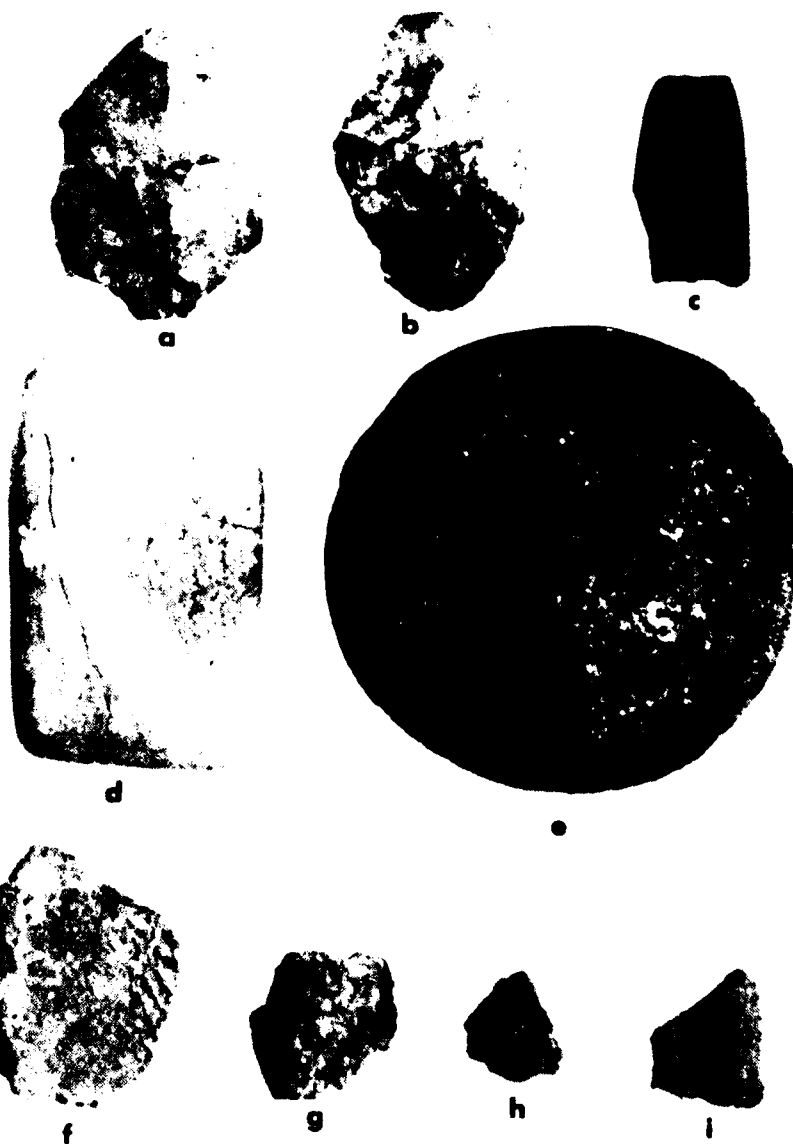


PLATE 26. LITHIC ARTIFACTS AND PREHISTORIC CERAMICS FROM 1Ma33/50.
 a, Broken Biface Reworked into a Punch/Graver; b, Bifacial
 Preform; c and d, Celts; e, Discoidal Groundstone; f,
 Sandy Cord Impressed; g, Cox Punctate; h, Bluff Creek
 Simple Stamp; i, Mulberry Creek Plain.

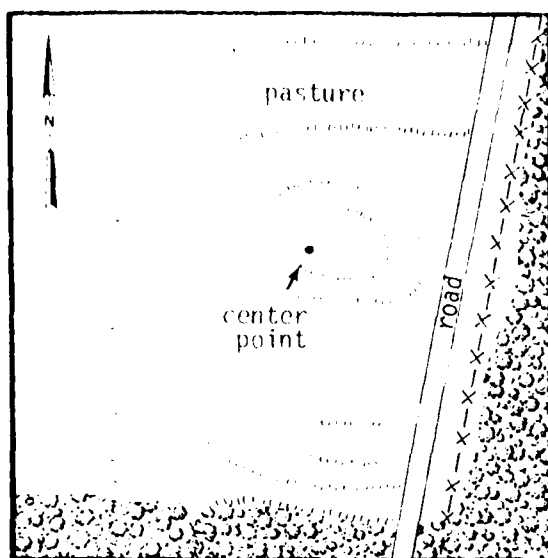


FIGURE 28. SKETCH MAP OF SITE 1Ma140.

measuring approximately 40 to 50 meters (131 to 164 feet) in diameter. A shovel-pitting program, undefined in the survey report, was conducted at the site, in addition to a surface collection undertaken along a roadway at the eastern boundary of the site. No midden or features were located during the subsurface testing, but artifactual material included three complete projectile points of the types Swan Lake, Camp Creek, and Bakers Creek, plus a projectile point mid-section, a drill bit fragment, two biface axes, a utilized flake, a core, one hammerstone fragment, and ninety-five flakes. Unfortunately, the report does not distinguish which materials were found in shovel pits, and which were recovered from the surface collection, but, on the basis of the diagnostic projectile points, a general Woodland period chronological placement was suggested.

Current Work: The testing methodology employed at this site departed slightly from the standard procedures used during the testing program at the majority of the sites. Surface artifact densities, with the exception of the roadway materials, were quite low at the site, and the pasture cover generally obscured ground visibility. Consequently, after a general reconnaissance of the site area, an arbitrary centerpoint was located, slightly to the east of the rise crest, and radial transects were run in eight directions from the center point. Shovel-pitting was then undertaken every five meters (16.4 feet) along each radial, with the pits averaging about 50 centimeters (19.7 inches) square, and 30 centimeters (11.9 inches) in depth. The artifacts recovered from this radial transect survey were then plotted on a general site map in order to determine horizontal site boundaries, as well as to illustrate artifact densities (Figure 29).

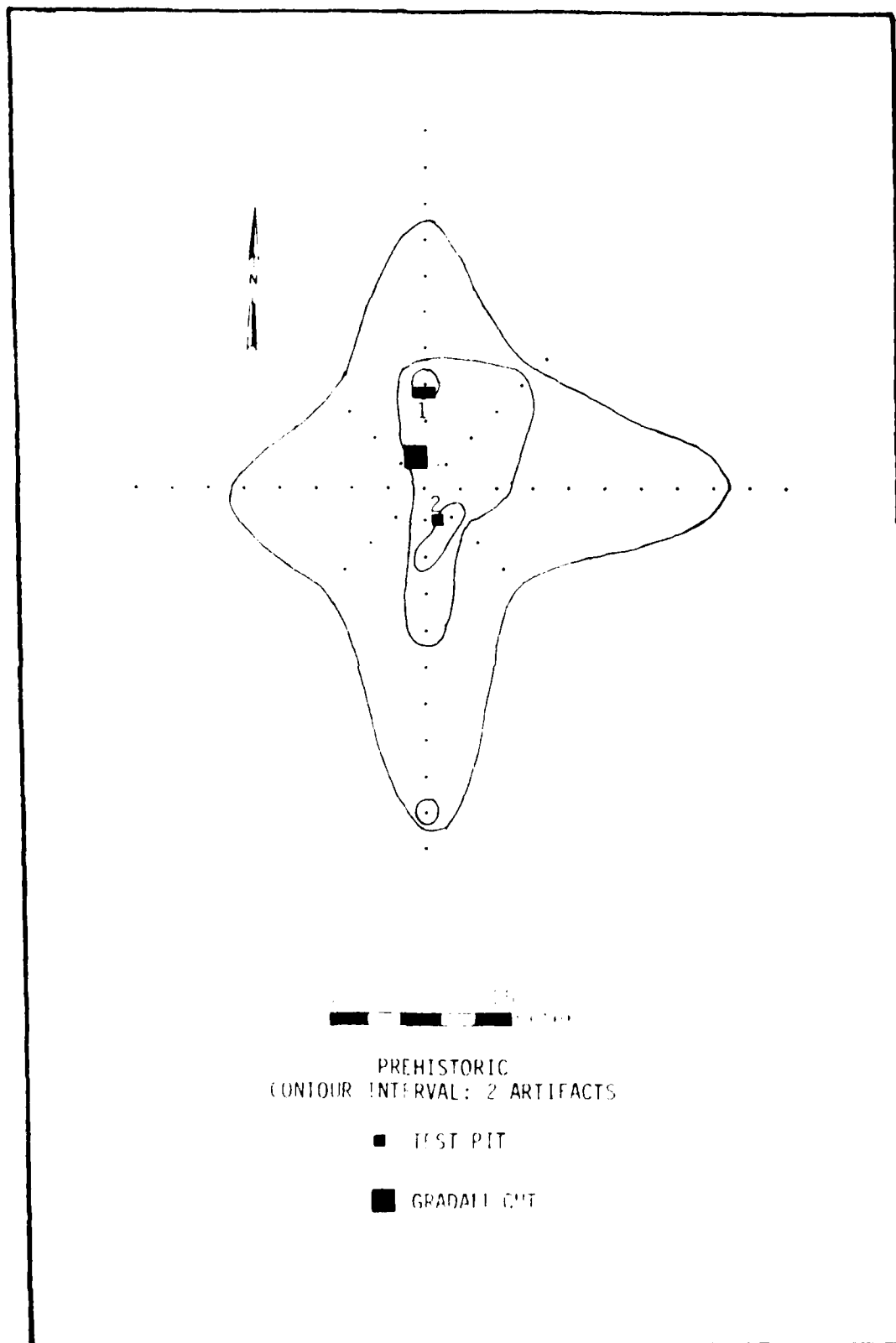


FIGURE 29 . FREQUENCY CONTOUR MAP OF SITE 1Ma140 SHOWING RADIAL
TRANSECT GRID, TEST PITS AND GRADALL CUT.

The initial transect survey revealed the site to encompass 5,200 square meters (55,973 square feet), and to measure approximately 80 meters (262 feet) north-south and 65 meters (213 feet) east-west. Although a general surface collection of the artifactual material in the roadcut was made after both the general surface reconnaissance and systematic shovel-pitting program, the latter indicated that the site does not extend to the east of the road. The main concentration of materials was located to the north, south, and east of the arbitrary center point, or downslope from the rise crest. Based on the results of the shovel-pitting, two test units were placed in high-density locations. Test Pit 1 is situated at 13N/1W-1E, and is a one-meter by two-meter (3.28 feet by 6.6 feet) excavation unit. Test Pit 2 is located at 4S/2E, and is a one-meter square unit (3.28 feet). The differentiation in unit size, the only instance in which a unit larger than one meter square was utilized, resulted from an ill-conceived attempt to establish, early in the project, the relationship of the upper strata humus and plowzone to the lower strata undisturbed B horizon.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below the surface. The stratigraphy of the unit revealed three strata. The upper stratum is a pasture-grass and humus zone, averaging five centimeters in thickness, and is clearly differentiated from the underlying Ap horizon (Stratum 2). Stratum 2 is a yellowish-red (5YR 5/6 to 5YR 4/6) silty clay loam, differentiated from Stratum 3 (2.5YR 4/4 reddish-brown silty clay loam) by the presence of cultural materials and of cultural disturbance from plow action. The majority of artifacts were confined to the upper two strata with isolated flakes occurring in the upper five centimeters (1.9 inches) of Stratum 3.

Test Pit 2 was also excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) and exhibited an identical profile to that of Test Pit 1. As with Test Pit 1, all cultural material was confined to the upper two strata. No evidence of midden or features were found in either pit.

Because disturbance at this site resulted primarily from continuous plowing, we felt there was a possibility that some areas of the site might have escaped the plow and undisturbed features might be present. Consequently, a five meter (16.4 feet) square gradall cut was made between Test Pits 1 and 2 on the downslope side of the small ridge crest. The cut was cleared to a depth of 30 centimeters (11.9 inches) and shovel skimmed. No indications of features were identified.

On the basis of artifactual material recovered (Table 10), occupation of the site area occurred during the Middle and Late Archaic and the Late Woodland periods (Plate 27). Alexander (1979:109) also reported a Middle Woodland component. The possibility, therefore, exists that the Woodland period occupations at this site were associated with the Woodland activity at 1Ma31/32 and 1Ma33/50 since these

TABLE 10. ARTIFACTS RECOVERED FROM 1Ma140.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
CERAMICS				
Mulberry Creek cord-marked	1			1
McKelvey plain	2			2
Total	3			3
LITHICS				
Chipped stone				
Flakes, unmodified				
Primary		1	4	5
Secondary	6	2	4	12
Tertiary	35	39	36	110
Flake frag., unmodified				
Primary	1			1
Secondary		5	1	6
Tertiary	34	54	30	118
Debris, unmodified	21	28	23	72
Flakes, modified				
Primary	3			3
Secondary	2	1	2	5
Tertiary	2		4	6
Flake fragments, modified				
Secondary		1		1
Tertiary	2			2
Core, unmodified	3		1	4
Unifacial tools				
Side scraper	1			1
Graver	1			1
Bifacial tools				
Unid. frag., no apparent usage	2	3	1	6
Spokeshave		1		1
Unid. frag w/scrapping use	1			1
Drill			1	1
Projectile points				
Knife/proj. pt. frag.	2	1	1	4
Copena Triangular	2			2
Type 113 - Faulkner and McCollough (1973)	1			1
Swan Lake		1		1
Morrow Mountain rounded	1			1
Total	120	137	108	365
HISTORIC				
Ceramics				
Whiteware, blue	1			1
Total	1			1

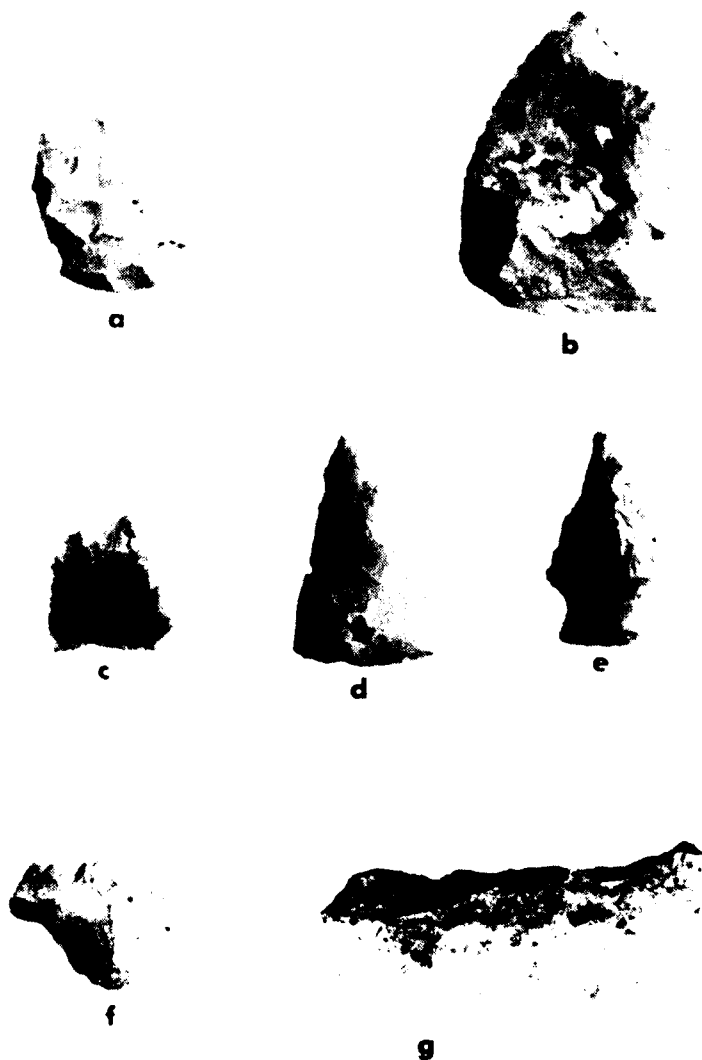


PLATE 27. LITHIC ARTIFACTS FROM 1Ma140 AND 1Ma142.
 From 1Ma140: a, Type 113 Projectile Point;
 b, Morrow Mountain Rounded; c and d, Copena
 Triangular; e, Swan Lake.
 From 1Ma142: f, Gary; g, Bifacial Backed Side
 Scraper.

site areas are separated from 1Ma140 by the Boundary Canal, an historic land modification.

1Ma49: Introduction and Topography

As will be discussed more fully in the previous investigations section, 1Ma49 was completely excavated in 1941 by H. Summerfield Day. At the conclusion of that field project, all backfill material was repositioned with the aid of a backhoe, and the mound essentially recreated. Therefore, the procedures conducted at the time of the New World Research work at the site involved the relocation of the site area and reconstructed mound and limited subsurface testing and surface collection.

The 1Ma49 mound is on the southwestern side of a rocky-soiled knoll with limestone outcrops. This protrusion above the upper alluvial terrace surface rises to a maximum elevation between 178 meters (584 feet) and 179 meters (587 feet) ASL, some four meters (13 feet) above the surrounding terrace top. The site is on a southwest-trending spur from the knoll; crestal elevation of the spur is two or three meters (6.6 or 9.8 feet) below the highest part of the knoll.

The knoll and spur bound two sides of a closed basin, apparently a sink, and the alluvial terrace completes the closure. The deepest portions of the basin are adjacent to the lower slopes of the knoll; several sapping depressions, well-defined basins from one to a few meters across, occur at the slope change from the sink floor to the slopes of the knoll. One of these depressions lies 30 to 40 meters (98 to 131 feet) north-northeast of the mound. This depression is bounded on the knoll side by a limestone outcrop, and an entrance opens into a low 0.5 meters (1.6 feet) cave passage under the knoll. Although the cave was inspected, it was partially collapsed and the entrance way would not allow even a small adult to enter.

Ephemeral ponds in the sapping depressions would have been the only water source within 250 meters to 300 meters (820 to 984 feet) of the site in prehistoric times. Data are insufficient for determination of the condition of the sapping depression closest to the 1Ma49 mound location during the prehistoric occupation. It is possible that the depression and associated cave were known to the builders of the mound.

1Ma49: Archaeological Investigations

The extent and results of the 1941 excavations at the site will be detailed below. It was apparent, at the time of the New World Research revisit to the site location, that certain topographic and landmark features had been obliterated or changed since the time of the 1941 work, resulting in the obscuring of the site location. While the site, during the 1941 excavations, was in a wooded pasture location, by the 1980 revisit the site lay within a secondary-growth forest location (Plate 28). It is difficult to determine the extent



PLATE 28. IMa49 LOOKING NORTHEAST. THE MOUND IS LOCATED IN THE FOREST JUST INSIDE THE CORNER OF THE TREE STAND IN THE FOREGROUND.

of modification to the site area in the intervening years between the two projects; however, it is apparent that the southern and western off-mound portions of the site have been impacted by plowing and cultivation.

Previous Work: The initial recording of the site was done by H. Summerfield Day, who had identified the site location during work conducted at IMa 31/32. In March, 1941, excavations were begun at the site under Day's supervision, and the excavations continued intermittently until the end of June of the same year. There is no indication that any village was associated with the mound, and surface artifacts, even in the immediate area of the mound and on the mound, were reported as sparse or non-existent (Day n.d.d; n.d.e). The mound was reported as conical, with a round base approximately 27.4 meters (90 feet) in diameter, averaging 1.5 meters (5 feet) in height at the center (Plate 29 and Figure 30).

The initial excavation, following mound clearance, was a 1.5-meter (5-foot) -wide north-south trench, running from the southern periphery of the mound inward to the mound center for a distance of 13.7 meters



PLATE 29. IMA49 PRIOR TO 1941 EXCAVATIONS. LOOKING WEST.
Courtesy of the Office for Archaeological Research,
Moundville, Alabama.

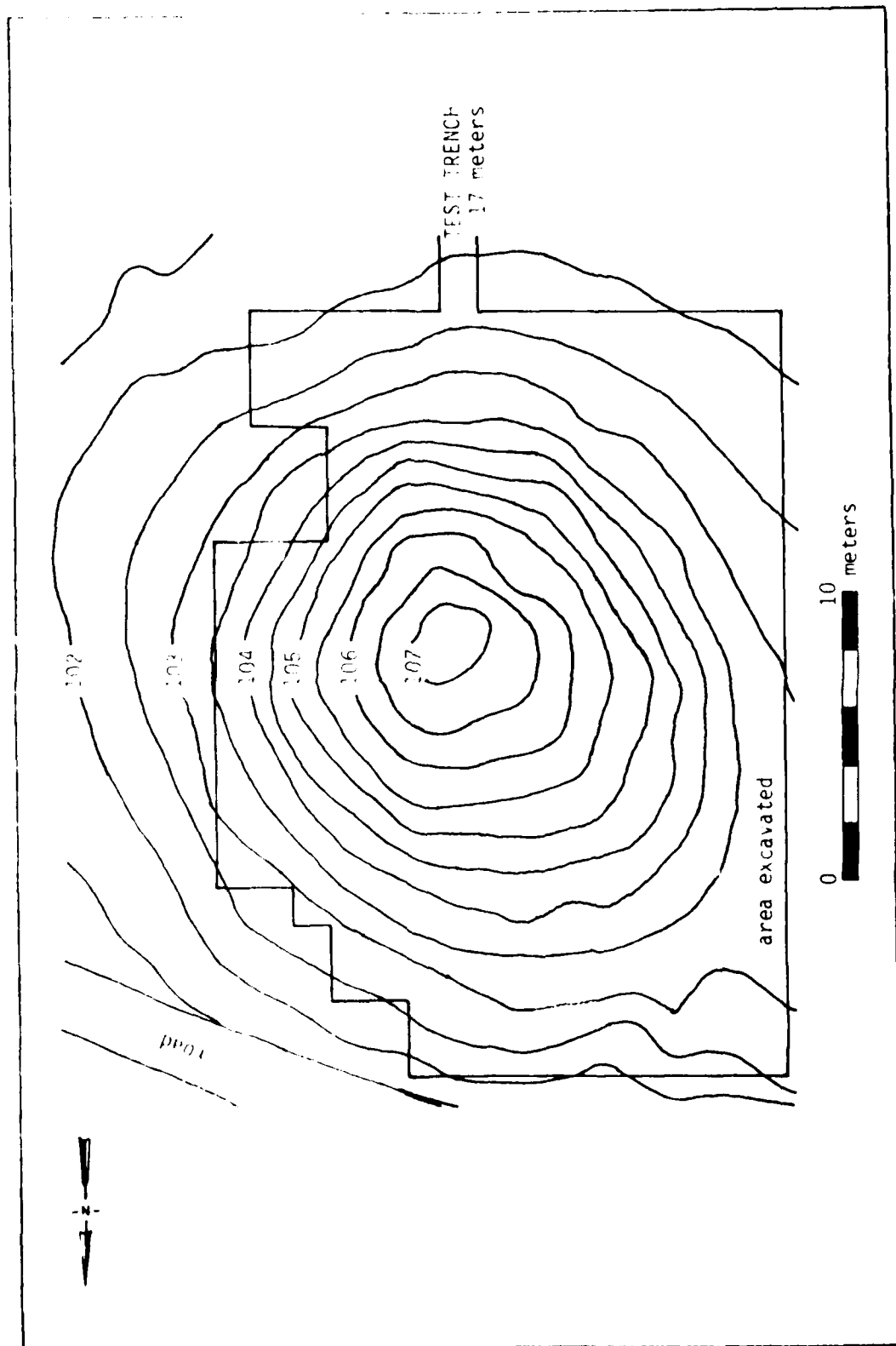


FIGURE 30. 1941 MAP OF SITE 1MA49 SHOWING NORTH-SOUTH EXCAVATION TRENCH. Courtesy of The Office for Archaeological Research, Moundville, Alabama.

(45 feet). This preliminary test indicated that the mound composition was "fairly uniform brownish-red clay, only slightly darker than the red clay undisturbed subsoil base" (Day n.d.e). While there were indications that the upper portions of the fill had been disturbed by root activity, there were no indications of more than one building stage involved in the mound construction. Following consultation with H. V. Andersen from the Alabama Museum of Natural History concerning the profile, Day slightly altered the approach being taken with the excavation, deciding to excavate the mound fully in order to define its use as a burial mound. Day gridded the entire site into 1.5-meter (5-foot) squares, and each square was designated by the coordinates forming the northeast corner of the square. Excavation "was started by a north-south trench between the 45 and 50 lines extending from the R10 line south to the R110 lines" (Day n.d.d) (Plate 30), and proceeded in the same manner to the 95 line, whereupon the length of the north-south trenches was reduced to encompass only the mound proper (Figure 30). Each north-facing profile, up to and including the 120 line, beginning with the 50 line, was drawn (Figure 31). Backdirt from each succeeding trenching procedure was replaced into the preceding trenches, which resulted in the mound being excavated according to a vertical slicing methodology. Therefore, by the conclusion of excavations, there was virtually no backfilling left, and all excavation fill had been replaced, essentially reforming the mound.

The excavations indicated that the original surface of the mound is slightly less than 0.5 feet (.15 meters) higher than the surrounding land surface. A series of burial pits had been excavated into the elevated rise, with the pit fill from the various features forming a portion of the mound superstructure. Although five of the forty-eight lower-level features overlap (Figure 32), it appears that the excavation of the burial pits and the mound construction were sequential events, with no time between the two stages to allow the formation of a humus layer. Subsequent to the construction of the mound, four features (burial pits) were intruded into the upper levels of the mound, but do not appear to be associated with the same cultural manifestation as the lower features. In addition, two of the lower-level features do not appear to have been intended for use as burial pits. In toto, fifty-four features were defined during the course of the excavation of the mound: four were late burial pits; two were not burial pits; and forty-eight were typical Copena burial pits. The latter will be discussed first.

The forty-eight Copena features are basically similar in construction, though variation does occur. All show careful excavation of walls and floor, with special emphasis on achieving a smooth right angle at the floor/wall junction. The pits are, however, not contemporaneous. Apparently, forty-three were constructed about the same time; however, as noted previously, five pits were constructed later, partially overlapped underlying features. The time lapse between the two pit constructions could not be determined, but it is apparent that all forty-eight were constructed prior to the final mound-building stage. The lack of any indication of buried A horizons



PLATE 30. 1941 PHOTOGRAPH OF SITE 1Ma49 SHOWING NORTH-SOUTH EXCAVATION TRENCH.

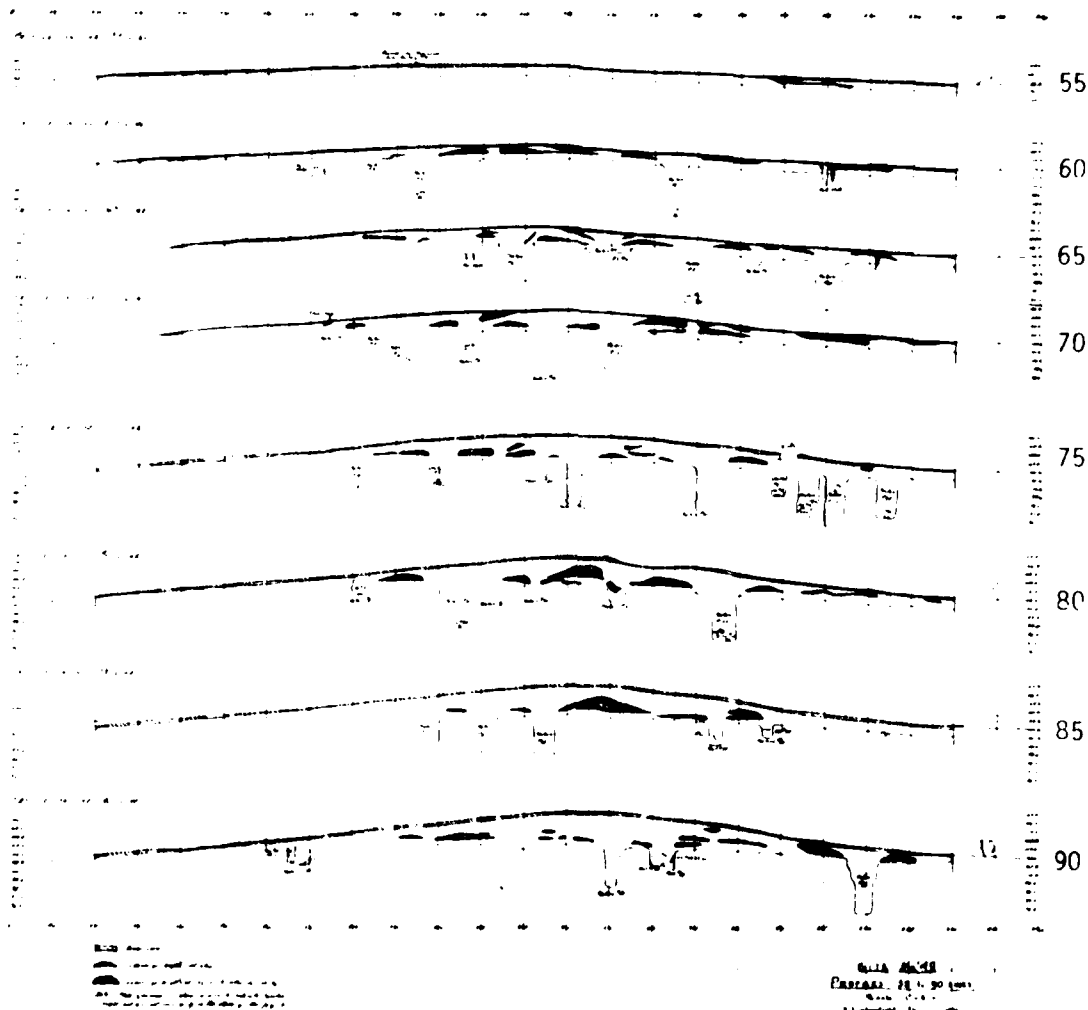


FIGURE 31. CROSS-SECTIONS THROUGH IMA49 SHOWING LOCATION OF FEATURES ENCOUNTERED DURING THE 1941 EXCAVATIONS BY H. SUMMERFIELD DAY. Courtesy of the Office for Archaeological Research, Moundville, Alabama.

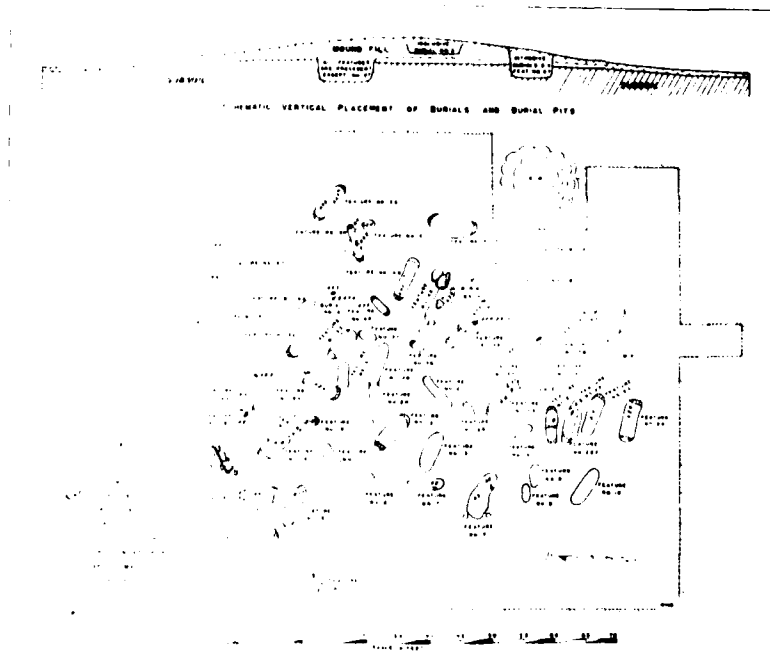


FIGURE 32. 1941 FIGURE OF 1Ma49 SHOWING LOCATION OF FEATURES AND BURIALS IN THE AREA EXCAVATED. (Courtesy of the Office for Archaeological Research, Moundville, Alabama)

within the mound would indicate that the period between the construction of the pits and the mound formalization was short, and would not have allowed for the development of an A horizon.

There is not a consistent pattern to the depth of the features, nor to their orientation or preparation. The deepest reaches some 1.9 meters (6.2 feet) below the baseline of the mound, while the shallowest extends only for 6.1 centimeters (0.2 feet) into the subsoil. Twenty-six of the features are oriented northwest-southeast, while the remainder are oriented northeast-southwest, east-west, or north-south. All the remainder (22) of pits lie west of the mound center, as noted by Day, "there is no apparent explanation for either this distribution, or for the direction of the pit axes" (n.d.d:5).

Twenty-one of the pits had foreign clay deposits present, usually at each end of the bottom of the pit. The unshaped, non-puddled clay masses averaged 9.1 centimeters to 12.1 centimeters (0.3 to 0.4 feet) in thickness. Four other pits exhibited clay deposition which extended over most or all of the pit floor, while, in one pit, the clay mass had been placed across the center of the feature. The clays utilized were either white, yellow, gray, greenish, or blue-gray in color. Day implies no specific function for the clay deposits, though it should be noted that he does mention similar structural features as being present in other Copena burial sites.

Although the presumed function of the pits is mortuary, bone fragments were identified in only one of the 48 Copena pits. Decomposition of bone is attributed to the impervious nature of the clay subsoil, which "would hold moisture around the bodies for a long time after interment" (Day n.d.d:12). There was no correlation between pits with clay masses and pits with artifactual materials, and it would, therefore, seem that Day's conclusion as to the reason for the absence of bone is undoubtedly correct, assuming that artifactual material usually accompanies the actual interment.

With regard to artifacts found in association with the forty-eight features, no more than four items were found in any one feature, and, the majority of times, only one artifact was present. Galena pieces, some with shaping, occurred in fifteen of the features, and greenstone celts or spades occurred in eight. Three of the remaining twenty-eight features produced one example each of greenstone and galena. Additionally, two of these features produced examples of copper objects, and, also, one piece of galena. Only one piece of pottery, a perforated limestone-grit-tempered disc, was found in a Copena feature context.

At levels contemporaneous with the Copena burial pits were two features apparently not intended for mortuary uses, though one could be an unfinished burial pit. The first feature, designated Feature 1 by Day, is situated on the west side of the mound. The feature was approximately 0.9 meters (3 feet) in diameter, with a maximum depth of 21.3 centimeters (0.7 feet). The sides were sloping and the bottom rounded, though definition of the feature floor was hampered by the intrusion of tree roots into the feature. Numerous fire-cracked and fire-burned stones covered the top of the pit, and occurred intermittently throughout the fill. Though no evidence of wall-firing was discerned, Day postulated that the pit was used as a fire-basin (n.d.d:7). The second feature (Feature 36) apparently is an unfinished burial pit.

Four features, all burial pits, were intrusive into the upper fill of the mound (Features 17, 29, 41, and 47). Badly disintegrated and very fragmentary burials were found in each of the features, though only one produced any artifactual material, a small, broken, grit-tempered water jar. There is some question as to whether or not the vessel had ever been fired, and, though the jar appeared complete when first exposed, removal caused breakage along the coil lines.

Three of the intrusive pits were first identified by a "carelessly arranged pile or line of limestone rock" (Day n.d.d:7), which extended to, or nearly to, the surface of the mound. The pit outlines of all four were indistinct, the pits having been refilled after interment of the burials with the same red clay which formed the matrix of the mound. Only a slight variation in hardness allowed for the definition of the pit outlines. As opposed to the Copena features, there had been no utilization of foreign fill in the features.

In conclusion, the results of the Day excavations at 1Ma49 indicate that four primary stages of events occurred at the site. Stage 1 was the preparation of the initial forty-three burial pits on a slightly elevated rise. Stage 2 was the subsequent excavation of five additional burial pits, overlapping Stage 1 features. During Stages 1 and 2, fill material from all the pits was piled to the sides of the features, and formed portions of the subsequent mound fill. Therefore, in the lower levels of the mound, distinct red lenses are apparent, resulting from the use of the feature fill in the construction. Stage 3 was the actual construction of the mound, which appears to have occurred within a short span of time of the first two stages. The final Stage 4 was after the Copena period Stages 1 through 3, and resulted in the intrusion of four additional burial pits into the mound top. The presence of a possible Mississippian vessel in association with one of the burials would seem to indicate a Mississippian Period date for the occurrences of the Stage 4 events; however, the dearth of artifactual material associated with Stage 4 makes it impossible to date with confidence the Stage 4 events.

Current Work: The initial problem faced during the reexamination of the site location was to determine exactly where the mound had been situated. In the years between the 1941 excavations and the 1980 testing program, continuing cultivation of the land to the south and west of the site had resulted in the displacement of the access road to the site, which figured prominently in Day's map coordinates for the site. Examination of aerial photographs and on-ground reconnaissance resulted, finally, in the relocation of the mound.

Both on-mound radials and off-mound transects were conducted, in an effort to determine if a possible village association with the mound could be defined. Artifact densities were negligible, with the small amount of artifactual material confined to off-mound contexts (Figure 33; Table 11). During the course of the radial program, it was apparent that the mound had been disturbed by pothunters, who were probably unaware that the entire structure had been fully excavated. In lieu of test pits, one profile in a pothunter hole at the eastern end of the mound (Figure 34), and one 50-centimeter (19.7 inch) square off-mound shovel test, were placed at the site.

Current Results: The total excavation of the mound structure by Day obviated the necessity of further testing at the site vicinity. The purpose of the profile and shovel test was to gather additional data on soil types and colors. As will be noted in Figure 34, the profile failed to reveal any indications of midden or building levels, and it is apparent from an examination of the profile that Day's excavations have obliterated any evidence of the building sequence of the mound.

Our excavations recovered no artifactual material; the only cultural remains found at the site were from the surface transects to south and west of the mound. Given the proximity to the mound of

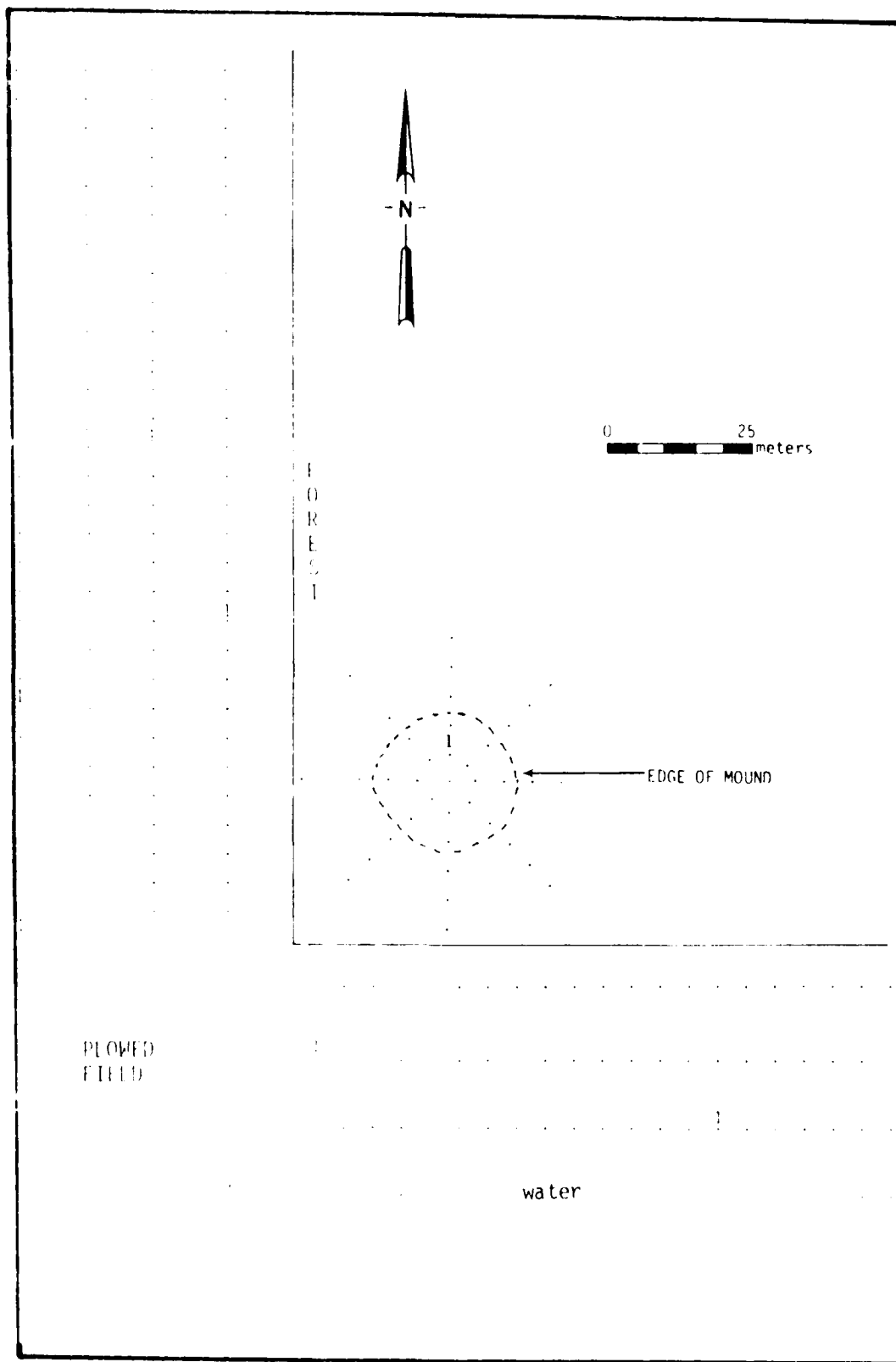


FIGURE 13. MAP OF SITE 1Ma49 SHOWING FREQUENCIES OF ARTIFACTS RECOVERED FROM LINEAR AND RADIAL TRANSECTS AND THE LOCATION OF THE MOUND.

TABLE II. ARTIFACTS RECOVERED FROM 1Ma49.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flakes, unmodified	
Tertiary	1
Bifacial tools	
Unid. frag., scraping use	1
Groundstone	
Battered pebble <64mm	1
Small battered cobble	1
Battered lg. cobble frag.	1
Mano on battered cobble	1
Mortar	1
Total	7

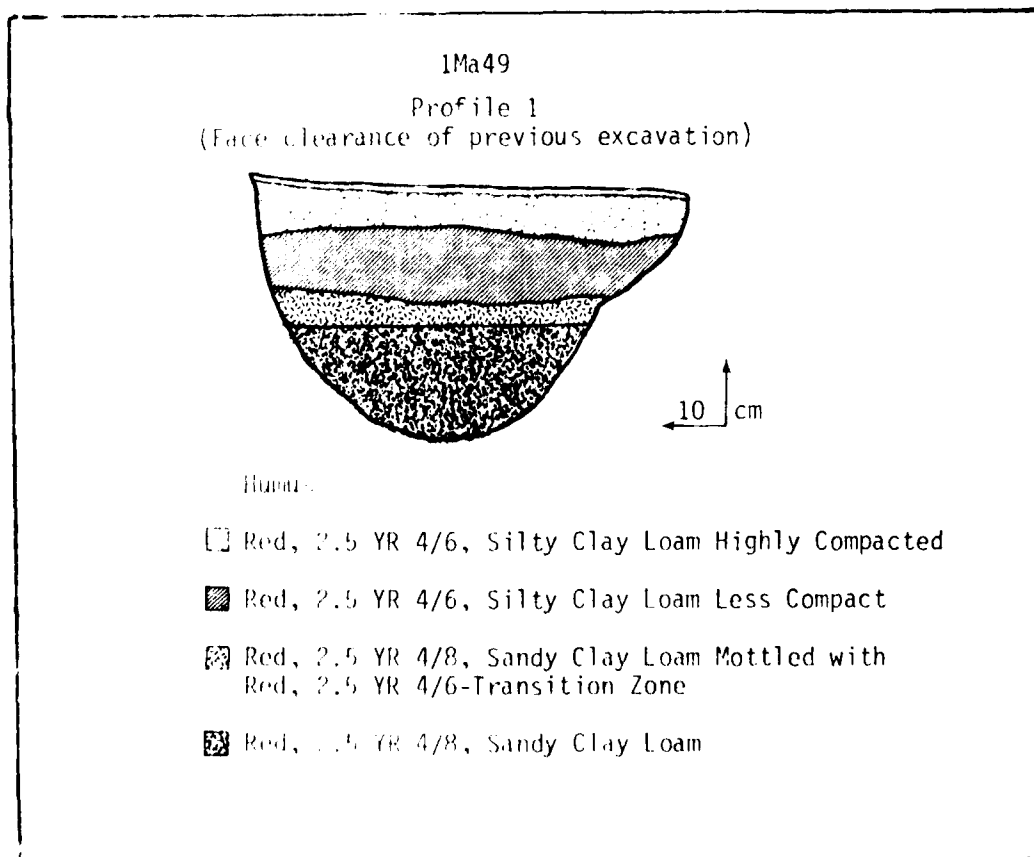


FIGURE 34. PROFILE OF PREVIOUS EXCAVATION UNIT AT SITE 1Ma49.

1Ma31/32, there is no way we can determine if the small quantity of surface material found in the investigation of 1Ma49 (Table 11) is related to the Copena occupation at the latter site or occupation at the former site. Clearly, Day's work (n.d.d; n.d.e; n.d.f) indicates the mound was a Copena site with later re-use during the Mississippian period, but our results can offer no additional information concerning the primary or secondary occupation of 1Ma49. It is possible that the cave near the mound might contain artifactual material dating to the Copena period since use of such shelters is well-documented (Walthall n.d.); however, as mentioned above, it was not possible for us to physically investigate that feature.

1Ma142: Introduction and Topography

The upland Tennessee River terrace, which measures 200 meters (656 feet) wide, at this site is much narrower than at sites 1Ma31/32, 1Ma33/50, and 1Ma149 to the east. Local relief is greater at 1Ma142, because the eastern end covers part of an elongated rise above the recent Tennessee River terrace, and the central and western portions lie on a limestone-bedrock ridge nose, which extends south-southeast from the upland ridges to the north. Maximum elevation on this nose is approximately 177.4 meters (582 feet) ASL, and, on the rise to the east, it is approximately 175.3 meters (575 feet) ASL. A gentle southward slope leads down to a narrow, shallow swale on the recent river terrace. The swale bottom lies at approximately 170.7 meters (560 feet) ASL.

1Ma142 may also differ from those sites farther east in its probable source of potable water. At present, the surface of the recent Tennessee River terrace adjacent to the site exhibits no well-defined swales which might contain long-lasting ponds. However a large (but unnamed) perennial stream lies 250 meters (820 feet) west of the western end of the site. It drains the uplands to the northwest and north of the site. A smaller, possibly intermittent, stream passes some 250 meters (820 feet) south of the site in a swale on the lower alluvial terrace. This stream collects water from four drainage swales which join just east of the site. One of these swales lies immediately north and northeast of the site. In its present condition it contains no well-defined channel, but does transmit surface and ground water in a series of shallow, boggy depressions. The indigenous population could probably have found this swale a relatively constant and convenient source of water. It is also possible that a pond was present in a swale at the foot of the slope south from the site, but that the swale has been largely filled and nearly obliterated by development of a bar on the inner portion of the recent Tennessee River terrace.

1Ma142: Archaeological Investigations

The site is located along the western boundary of the project corridor, and lies within the Hazardous Demolition Test Area of Redstone Arsenal. While the majority of the immediate area of the

site is pasture grassland, a significant portion of it has been impacted by the military construction of a demolition testing pad (Figure 35) and associated test facilities. The primary impact from the construction has been surficial; however, at least one subsurface unit, a concrete-lined tunnel structure which leads to the test wall adjacent to the demolition pad, has impacted the subsurface integrity of the site area. In addition, Backhoe Trench I 24-3, placed at the junction line of the pasture and woodline along the southwestern edge of the site, indicated that, during the construction of the test facilities, soil displacement occurred. The exact extent, however, of overburden removal is not known, nor, during the testing of the site, did it appear that the entire area of the site has been disturbed in a similar manner.

Previous Work: The site was originally recorded during the 1978 survey of selected portions of Redstone Arsenal (Alexander 1979:110-111). On the basis of an unsystematic surface collection and shovel-pitting procedure, the site was reported as 100 meters (328 feet) east-west, 20 to 30 meters (65.6 to 98.4 feet) north-south, with 30 to 40 centimeters (11.8 to 15.8 inches) of cultural deposits. No diagnostics were recovered either during the collection or during the subsurface testing, although two biface fragments, one biface preform I, ninety-eight flakes, four utilized flakes, a hammerstone, and a core, among other items, were identified. On the basis of the artifactual assemblage, Alexander could make no determination as to a cultural affiliation, though he did note that localized midden deposits and sub-plowzone features were present.

Current Work: The impact to the site had been profound enough that much of the surficial artifact material extent may have been directly related to movement of materials during the various construction phases. As Backhoe Trench I 24-3 indicated during the deep-testing program, there was a definite indication that surface soils had been moved toward the south and southeast during, probably, the construction of the main demolition pad. Therefore, prior to the initiation of the radials at the site, an intensive non-collection surface reconnaissance was conducted, in order to determine the presence of possible undisturbed, or minimally disturbed, areas of cultural materials. It was determined, during the surface reconnaissance, that two distinct areas of concentration existed at the site, the core areas of each separated by approximately 160 meters (525 feet) (Figure 35). Each core area is treated, in terms of the collection radials, as a separate entity within 1Ma142.

The results of the radial collection procedure indicated that the site area encompasses 11,625 square meters (13,903 square yards), and that three concentrations of artifactual material are present (Figures 36 and 37).

Primary concentration in 1Ma142a coincides with the site as originally defined by Alexander (1979), with the majority of the

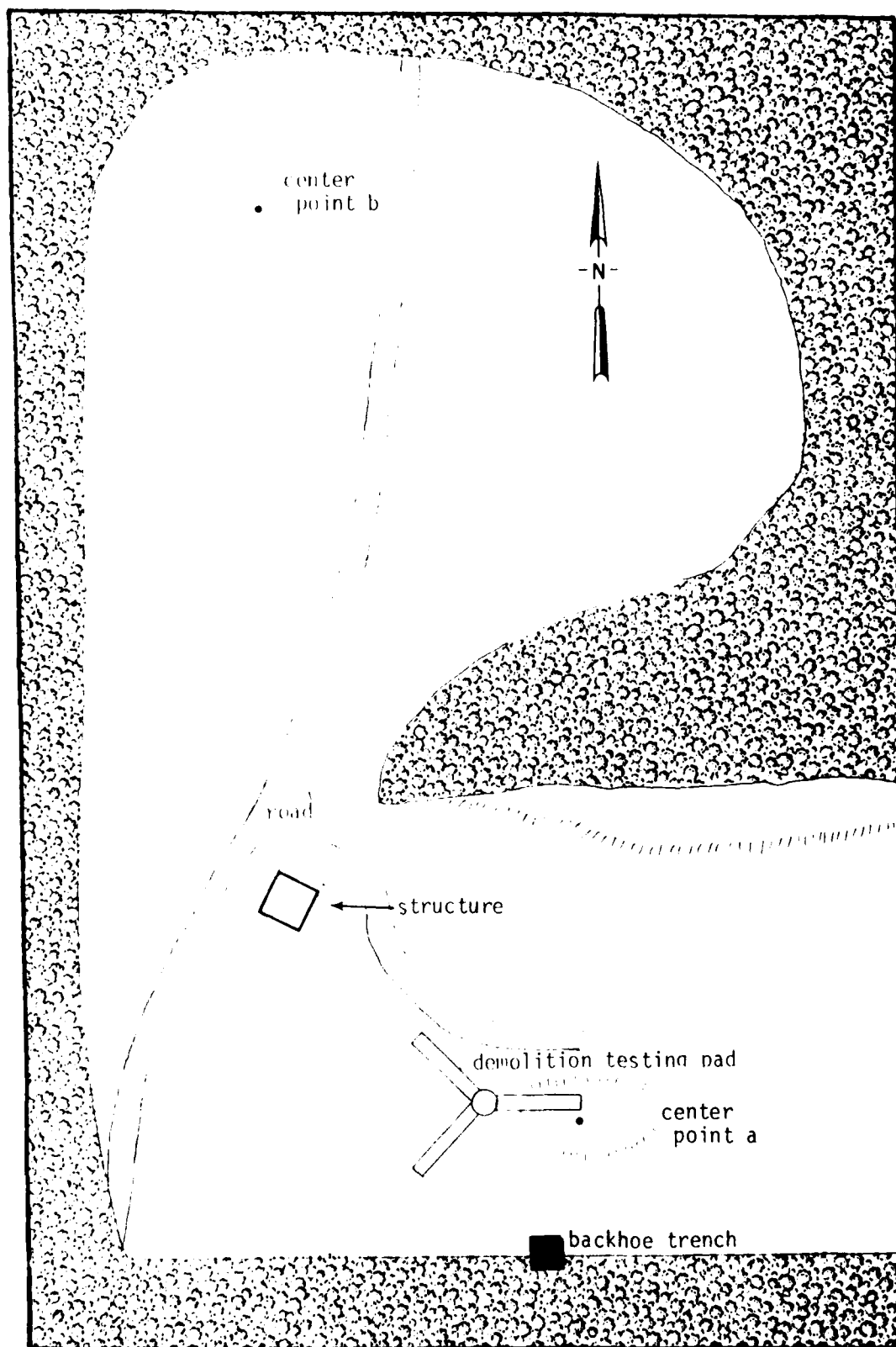
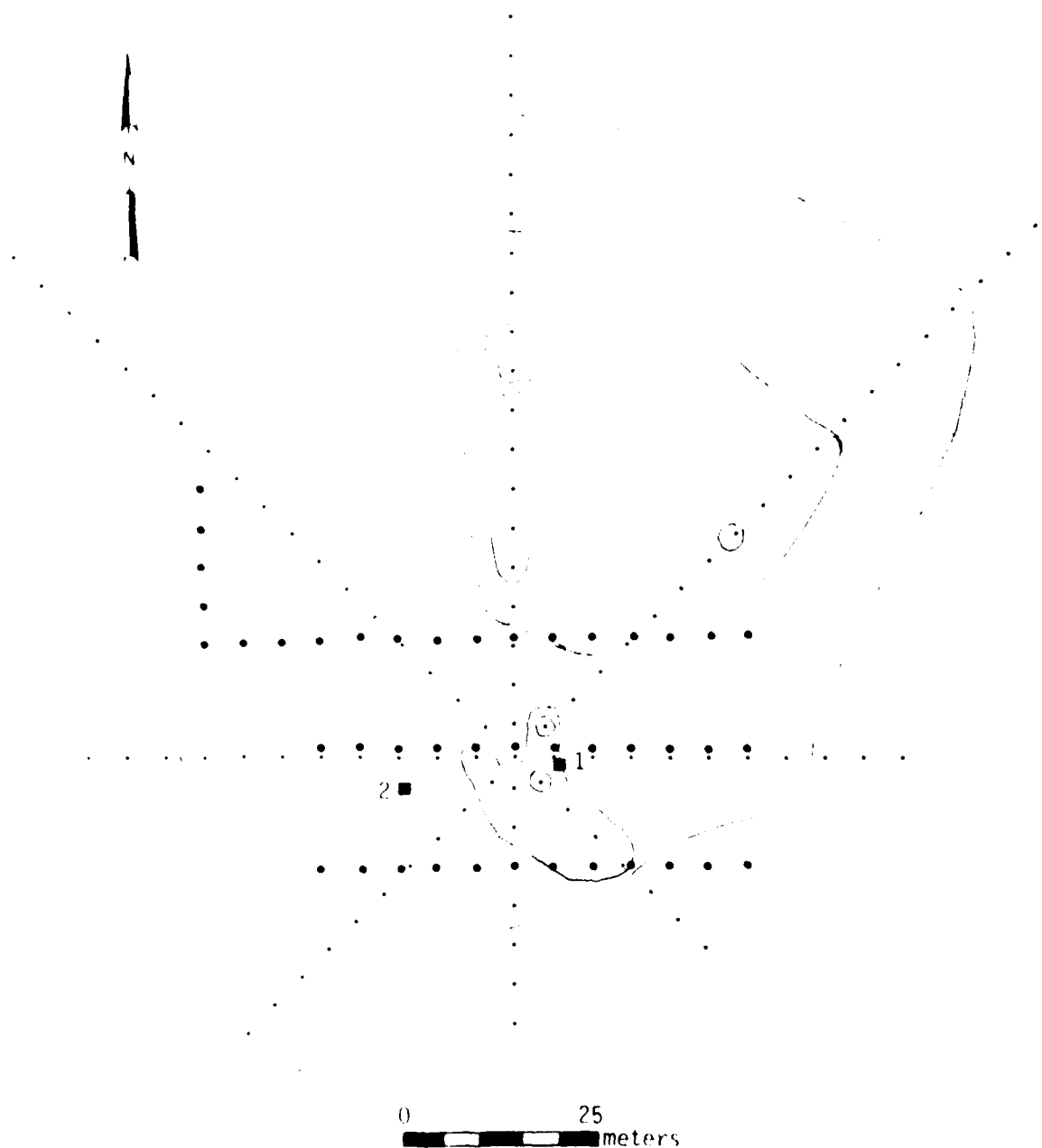


FIGURE 35. SKETCH MAP OF SITES 1Ma142 A & B.



PREHISTORIC
CONTOUR INTERVAL: 1 ARTIFACT

- TEST PIT
- AUGER HOLES

FIGURE 36. FREQUENCY CONTOUR MAP OF SITE 1Ma142a SHOWING LOCATION OF TEST PITS AND AUGER HOLES.

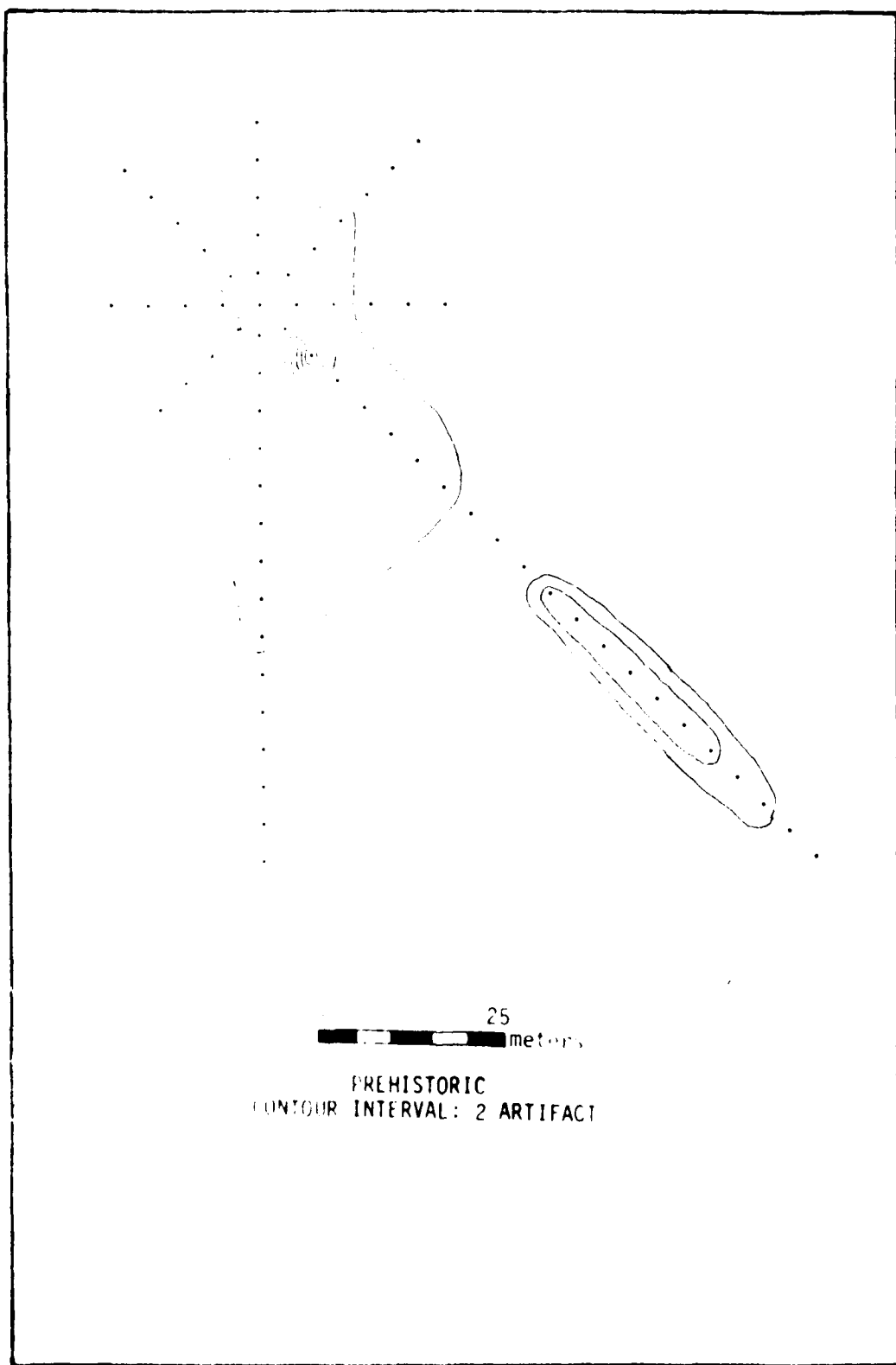


FIGURE 37. FREQUENCY CONTOUR MAP OF SITE 1Ma142b.

artifactual material identified to the north and northeast of the centerpoint within the area of maximum disturbance (Figure 36). Two additional concentrations were located during the radial transects, both being located in 1Ma142b (Figure 37).

As the testing program of the project was designed to test the previously recorded site areas, both test units were placed within primary concentration 1Ma142a, in an effort to determine the possible presence of midden or sub-plowzone features.

Current Results: Test Pits 1 and 2 exhibited virtually identical profiles, and each was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Stratum 1 is the plowzone, with an average width in both pits of 15 centimeters (5.9 inches), though it did occur as low as 20 centimeters (7.9 inches) along the eastern side of Test Pit 2. The stratum is composed of a reddish-brown (5YR 4/4) silty loam, and, in both pits, the majority of the artifactual material recovered was extracted from this stratum. The underlying Stratum 2 had not been disturbed by plowing, and, except for occasional occurrences of flakes in the upper three to five centimeters (1.1 to 1.9 inches), the stratum was sterile. Also composed of a silty loam, though its content is slightly more clayey than that of Stratum 1, the level of coloration in Stratum 2 varies from red to redder than 2.5YR 4/6.

The results of the test pit procedure failed to produce any indication of either midden or subplowzone features; therefore, a systematic augering of Area A was conducted, following the excavation of the test units. Three lines of auger holes were placed, running east-west across the area. The lines were spaced at 15-meter (49 feet) intervals from one another, with each auger hole placed at five-meter (16.4 feet) intervals along each line. The northernmost line continued for ten meters (32.8 feet) beyond the length of the other two, and turned at a 90-degree angle north in order to test a low ridge line (Figure 36). The augering reiterated the results of the test unit excavations, revealing no midden or sub-plowzone features.

Our investigations at this site yielded an appreciable quantity of lithic materials (Table 12), although the only diagnostic was a single Gary projectile point (Plate 27f). This point has a rather long temporal range which begins in the Late Archaic period, but can extend into the Woodland period. The absence of ceramics from the site, however, may be a clue that the occupation dates to the Late Archaic period. Alternatively, the site may have been utilized for extractive purposes in which case ceramics may not have been part of the artifact inventory for that particular activity. Our data are simply inadequate to do more than suggest the possible occupation or use of the site area. It is obvious, however, from the artifactual quantity, that the occupation was intense.

TABLE 12. ARTIFACTS RECOVERED FROM 1Ma142.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Primary		1	3	4
Secondary	6	8	10	24
Tertiary	73	46	50	169
Flake frag., unmodified				
Secondary	6	3		9
Tertiary	114	50	50	214
Debris, unmodified	38	15	26	79
Flakes, modified				
Secondary	2	1	1	4
Tertiary	7	2	1	10
Flake fragments, modified				
Secondary	1			1
Tertiary		2	1	3
Debris, modified	2			2
Core, unmodified	5	3	2	10
Unifacial tools				
Denticulate flake		1		1
Unidentified fragment	1			1
Graver	2		1	3
Bifacial tools				
Unid. frag., no apparent usage	2		1	3
Preform			1	1
Backside scraper	1		1	2
Unid. frag., scraping use			1	1
Projectile points				
Gary			1	1
Whole unid.	1			1
Knife fragments	2		1	3
Groundstone				
Battered lg. cobble frag.	1			1
Unmod. river cobble	1		4	5
Total	265	132	155	552
HISTORIC				
Glass				
Unid. bottle, green	1			1
Ceramic				
Whiteware, undec.		1		1
Metal				
Brass shell			1	1
Miscellaneous				
Plastic			1	1
Total	1	1	2	4

Site on the Recent Tennessee River Terrace

1Ma141: Introduction and Topography

1Ma141 is the only archaeological site identified and/or tested within the project area on or in the recent alluvial terrace. As discussed within the context of the upland terrace age north of the recent Tennessee River terrace, 1Ma141 provides an important archaeological date in the geomorphic history of the study area. For geomorphic and paleo-environmental interpretation, the important features of the site are (1) the interstratification of sterile Tennessee River sediments and midden deposits in bands several centimeters thick, and (2) the presence of Archaic midden and Woodland midden lenses.

The recent alluvial terrace on and in which the site lies is approximately 250 meters (820 feet) broad where the Boundary Drainage Channel cuts through it. The northern boundary of the terrace is a gentle slope down from rises of the older terrace. Approximately the northern half of the recent terrace is a 120-meter (394 feet) wide elongated basin, with a swampy, flat axial zone some 60 meters (197 feet) broad. South from the axial swamp, a natural levee or levee-top bar surface slopes upward to a crest at the former Tennessee River cutbank. Elevations range from below 170 meters (558 feet) ASL in the swampy depression, to 170 meters (558 feet) ASL at high points along the bank crest. This crest is less than ten meters (33 feet) wide between the gentle, ten to fifteen percent slope to the north and the forty-five percent slope down, either to the river edge, or to an eroded fringe of fragments of either an older swale or a levee face bar (see above).

1Ma141: Archaeological Investigations:

The site is situated just off the extreme southern boundary of Redstone Arsenal, on land currently administered by the Tennessee Valley Authority. A military access road to the Laser Testing Range, however, runs east-west along the terrace crest, in the western portion of the site. The site extends on both the east and western sides of the Boundary Canal for distances of 250 and 750 meters (820 and 2460 feet), respectively, but testing procedures indicate that it does not extend to the north of the military road into the swampy, flat axial zone. Fluctuating water levels in the Tennessee River are causing extensive erosion of the present bank profile (Plates 31 and 32), and much of the surface artifactual material identified is present on beaches, which are exposed only during low-water levels.

Previous Work: 1Ma141 was known previous to the 1978 resurvey of the site by Alexander (1979:109-110); however, no data pertaining to its original description are available. At the time of Alexander's reconnaissance of the site locality, the southern face of the bank was experiencing extensive lateral erosion from the Tennessee River's fluctuating water levels. Alexander made a surface collection from

PLATE 32. IMA141 CLEARING OF THE
PROFILE 1 CUT ON THE WEST-
ERN BANK OF THE BOUNDARY
CANAL.



PLATE 31. IMA141 LOWER BEACH LEVELS. NOTE SLUMPAGE OF
BANK, THE RESULT OF TENNESSEE RIVER WATER LEVEL
FLUCTUATIONS.

both the bank and beaches, and defined intermittent lenses of shell containing some ceramics and bands of dark soil "... containing artifacts" to a depth of six to eight meters (19.7 to 26 feet) below the surface of the bank (Alexander 1979:110). In addition to Big Slough and Ledbetter points, one ground stone fragment, examples of mussel shell, and flakes, were identified, and, within the narrative description of the site, ceramics are indicated to occur, though no definition of types is presented. On the basis of the lithic assemblage, and, presumably, that of ceramic occurrence, the cultural affiliation for the site is indicated as Archaic, and possibly Woodland.

Current Work: The extent of the lateral erosion of the bank is not known. An attempt on the part of the consulting geomorphologist to determine, from various maps and aerial photographs, any shift in river width or position, failed conclusively to demarcate the impact of the river. Nonetheless, during several visits to the site locality in the course of the project (at times of low and high water), it was evident that cultural materials extend at least two to three meters (6.5 to 10 feet) out from the cutbank on the low-water beaches. The lateral erosion is also causing intermittent bank slumpage.

It was apparent, during the initial reconnaissance of the site area, that the depth of cultural deposits as indicated by the bank profiles would obviate the use of test pits. Therefore, a four-stage approach was undertaken, consisting of (1) bank-surface shovel-pitting, to determine the north-south extent of occupation; (2) backhoe trenching, to determine the nature of the bank stratigraphy and the presence of deeply buried cultural deposits north of the bank profile; (3) the clearing, on a non-systematic basis, based upon areas without significant bank slumpage, of a series of bank profiles; and (4) the examination of the banks east and west of the Boundary Canal, to determine the relationship of the 1Ma141 deposits to those of 1Ma107 farther to the east along the Tennessee River north bank.

Stages 1 and 2 of the reconnaissance were conducted concomitantly. Transects were placed at 30-meter (98 feet) intervals along the road line, and extended, on an average, for 25 meters (82 feet) north into the axial zone. Each shovel pit was approximately 50 centimeters (19.7 inches) square, and approximately 35 to 45 centimeters (14 to 18 inches) deep. No cultural materials or indications of midden deposits were noted in the shovel pits. To the north and south of the military road, along the bank crest, four backhoe trenches, averaging two meters (6.5 feet) in length and one and one-half meters (4.9 feet) in width, were placed at random (Figure 38). Backhoe Trenches I 24-1, I 23-5 and I 23-6 revealed no evidence of cultural activity within the bank. However, Backhoe Trench I 23-7, the farthest west, indicated a well-developed midden lens occurring 1.5 meters (4.9 feet) below present ground surface. Immediately to the west of that trench was the restricted Laser Testing Range, and reconnaissance and testing procedures were halted at the fence line. A general surface reconnaissance

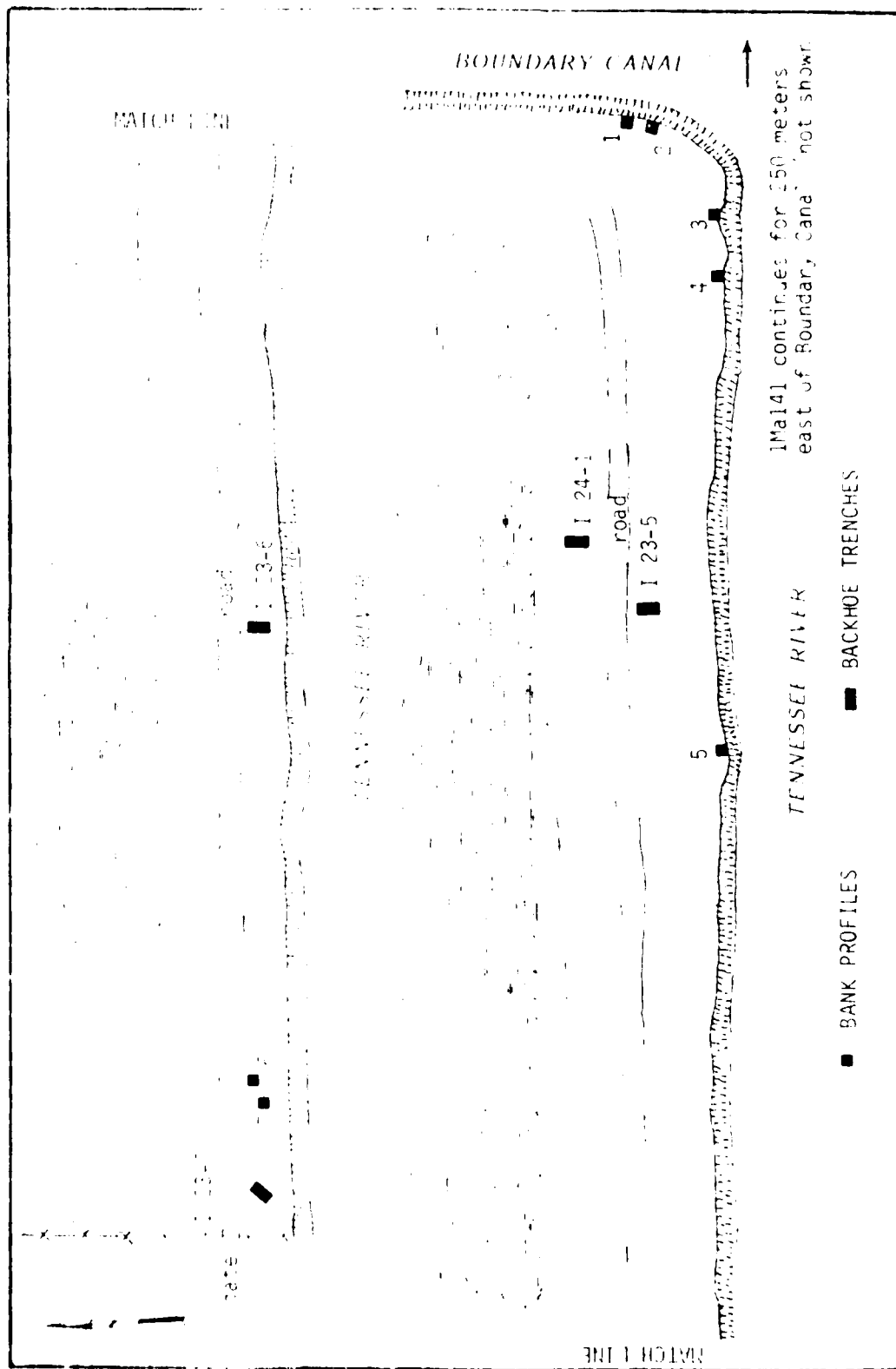


FIGURE 1. SKETCH MAP OF THE WESTERN SECTION OF SITE 1M141 SHOWING LOCATION OF BANK PROFILES AND BACKHOE TRENCHES

conducted during the course of both activities indicated that almost all apparent cultural material was present on the beach levels, well below the terrace/bank crest.

Because of the paucity of surface artifact material on the terrace/bank crest, and the depth of the midden lens in Backhoe Trench I 23-7, a series of random, non-systematic profile clearings was made, both on the western bank of the Boundary Canal, and on the south-facing bank of the terrace. Areas for the profile cuts were selected on the apparent absence of slumpage.

Current Results: The seven profile cuts (Plates 33 and 34, Figure 38) revealed the presence of midden deposits along the western profile of the Boundary Canal, and at the extreme western end of the site, adjacent to Backhoe Trench I 23-7. A reconnaissance of the eastern portion of the site, not originally included in the definition of the site by Alexander due to project restrictions, indicated again from visual inspection of bank profiles that midden lenses were present in addition to one highly distinctive concentration of shell midden which occurred approximately 150 meters (482 feet) east of the Boundary Canal. While indications of midden (though not shell midden) continue for another 100 meters (328 feet) farther east of the shell midden concentration, indications of cultural activities appear to cease, thereby creating, albeit perhaps arbitrarily, a boundary between the area of 1Ma141 and 1Ma107 still farther to the east.

Three of the seven profiles detailed on the western side of the Boundary Canal are of pertinent interest to the discussion of the cultural sequence at the site. Profile 1 (Plate 33) is situated on the west bank of the Boundary Canal, approximately 15 meters (49 feet) north of the Tennessee River. The profile extended 1.34 meters (4.4 feet) from the bank surface. Slumpage of the bank in the lower portions and high water did not allow for a continuation of excavation. Five strata were defined in the profile. Stratum 1 is a sandy clay loam, reddish-brown (5YR 4/4), with extensive root activity. No cultural materials were defined in the stratum. Stratum 2 is an indistinct transition zone between the apparently sterile Stratum 1 and a series of midden deposits below. It is a dusky-red (2.5YR 3/2) silty, sandy loam, that did not show evidence of humus decay or extensive root activity. Stratum 3 is a dark-reddish-brown (5YR 3/3) midden deposit, with yellowish-brown (5YR 4/6) mottling, which produced primarily flaking debitage. The underlying Stratum 4 appears to be a continuation of the midden deposit, and is a dark reddish-brown (5YR 3/3-3/2) sandy loam. Material was identified in situ in the stratum during the profile clearing. Because of the slumpage, it was not possible to determine if the Stratum 5 sterile silty loam deposits represent the actual termination of the cultural sequence in this section of the site, or if they represent intervals for the length of the profile.

At the extreme western end of the site, a set of profiles (6 and 7) was cut into the bank, with Profile 6 offset to the east of 7 by



PLATE 33 . IMA141 PROFILE 1 FOLLOWING
CLEARANCE. THE NARROW
COLUMN AT THE TOP OF THE
PROFILE IS THE RESULT OF
POLLEN SAMPLE REMOVAL.

PLATE 34. IMA141 PROFILE 7 FOLLOWING
THE REMOVAL OF THE UPPER
COLUMN OF POLLEN SAMPLES
IN THE MIDDEN.



approximately one meter (3.28 feet), in order to avoid the slumpage, and create a continuous profile of the bank section (Figure 39). The configuration of the bank was such that the base of Profile 6 is approximately even with the top of Profile 7, though erosion had clearly affected the bank, and the profiles must be considered separately, for there was no accurate way to determine the amount of soil removal from the upper portions of Profile 7. Profile 6 was excavated to a depth of 1.3 meters (4.27 feet) below the present bank surface. Three strata were defined, with Stratum 2 containing artifactual material, including ceramics. Stratum 1 is a yellowish-red (5YR 4/6) sandy loam, disturbed by extensive root activity. Stratum 2, the midden level, is a dark-reddish-brown (5YR 3/3) sandy loam. No evidence of bone or shell was apparent in the stratum; however, flakes, flaking debitage, and one ceramic fragment, were identified during the course of the profile clearing. Stratum 3, a yellowish-red (5YR 4/6) sandy loam, is devoid of cultural material. Profile 7 was excavated to a depth of two meters (6.6 feet), with the top of the profile occurring approximately 1.4 meters (4.59 feet) below the present ground surface. Two strata were identified. The upper, Stratum 1, is a dark-reddish-brown sandy loam (5YR 3/2), and is, apparently, a midden lens. Artifactual material identified during the profile clearing included both ceramics and chipping debitage. Following the profile clearing in both 6 and 7, pollen samples were taken for the length of each profile. The sample produced no identifiable pollen.

Our investigations revealed *in situ* midden deposits eroding from the bank on both sides of the Boundary Canal. Apparently, there is a chronological difference between the westernmost midden deposits, which appear to date to the Woodland period, and the easternmost midden deposits that date to the Middle and Late Archaic. Evidence of Paleo Indian occupation was also identified by the presence of a single Milnesand projectile point recovered from a surface context in the western portion of the site. The quantity of material collected during the surface reconnaissance and testing program (Table 13) does not reflect the actual amount of cultural material present over the entirety of the site area (Plate 35).

Sites of Bell Hill

1Ma222: Introduction and Topography

1Ma222 is a light scatter of historic ceramic, glass, and brick. Though the 1964 Farley 7.5' U.S.G.S. quadrangle map depicts a standing structure within the vicinity of the site, no structure was noted during the survey.

Drainage of precipitation of the hill occurs through first-order, ephemeral streams, and by percolation to the water table. Limestone outcrops of the upper slope show etching patterns typical of solution by rainwater. Even during a period of wetter climate, Bell Hill would probably not have had sufficient surface area to collect enough

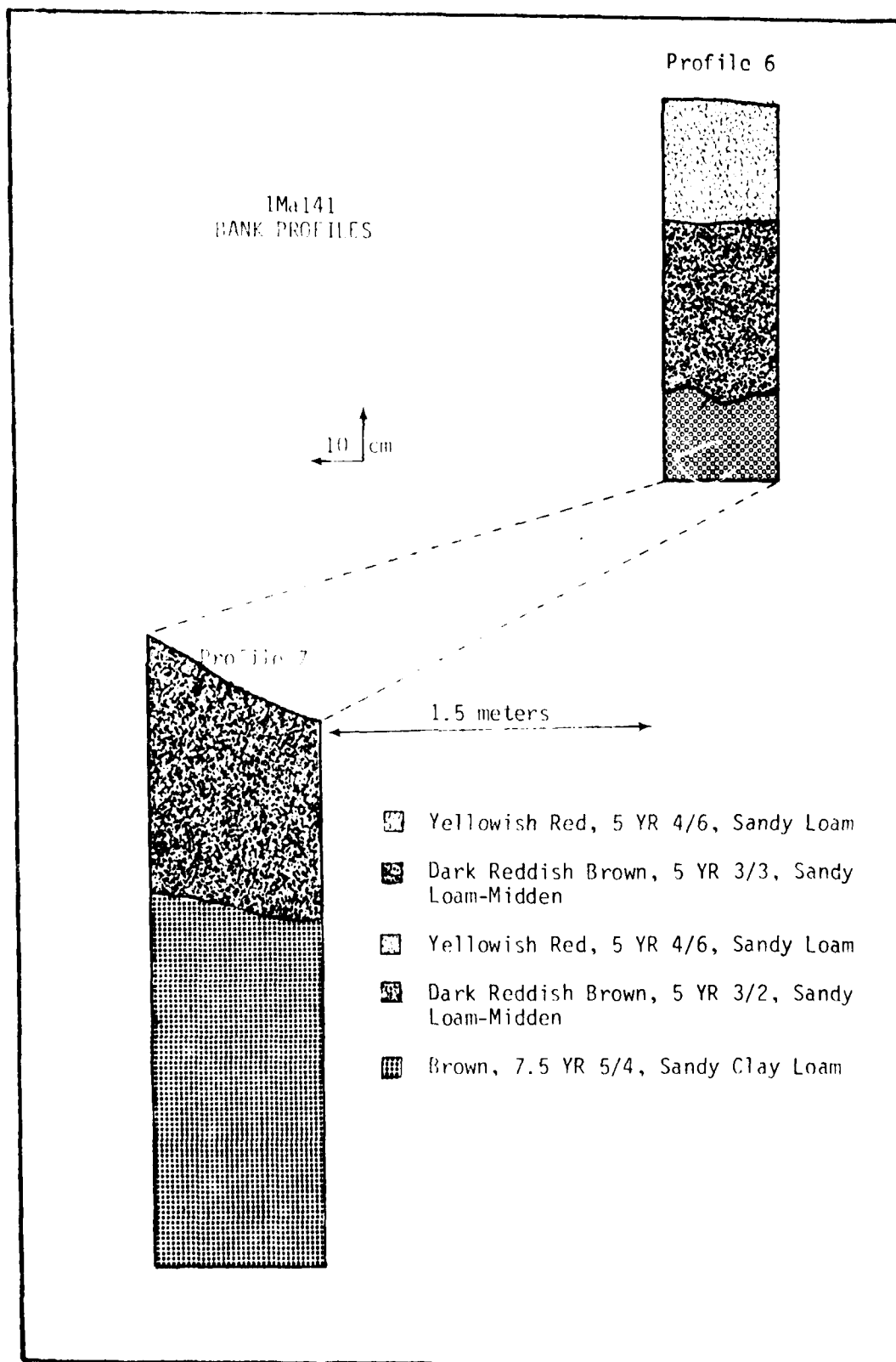


FIGURE 39. BANK PROFILE AT SITE 1Ma141. Note that profile is off-set by 1.5 meters.

TABLE 13. ARTIFACT RECOVERED FROM 1Ma141.

	Surface, Radials, & S. P.	Profile # 1	General Survey, Western Section	General Survey, Eastern Section	Totals
CERAMICS					
McKelvey plain	1				1
Wheeler check-stamped	1				1
Total	2				2
LITHICS					
Chipped stone					
Flakes, unmodified					
Primary		1		1	1
Secondary		1		1	1
Tertiary					2
Flake frag., unmodified		2		1	3
Tertiary				1	1
Blade					
Unifacial tools					
Transverse scraper	1			1	1
Spokeshave					1
Bifacial tools					
Large flat ovate	1				1
Projectile points					
Candy Creek			1		1
Minesand var.			1		1
Keys		1			1
Total	2	5	2	5	14

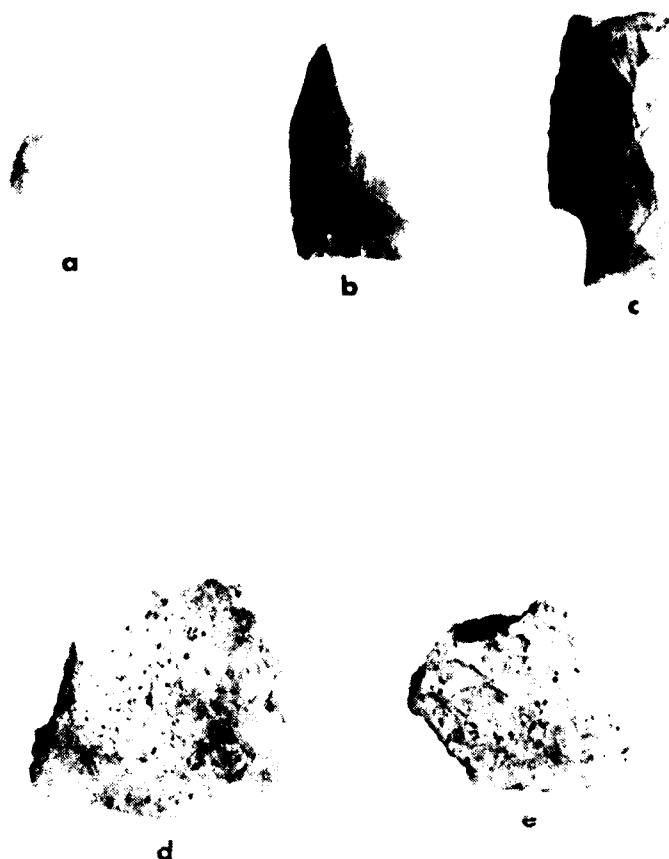


PLATE 35. PROJECTILE POINTS AND PREHISTORIC CERAMICS FROM 1Ma141.
 a, Candy Creek; b, Milnesand variant; c, Kays; d and e,
 Mulberry Creek Plain.

precipitation to keep springs active throughout the year. However, surface solution of the Ste. Genevieve limestone exposes primary chert nodules. Maximum observed dimensions of these nodules are approximately eight centimeters (3 inches), and they exhibit welded fracture lines. If larger nodules of this tough, gray chert are present in the Ste. Genevieve limestone, they could have been quarried and/or collected by prehistoric humans. Higher in the section at Bell Hill are outcrops of the Gasper formation, Hartselle sandstone, and Bangor limestone (Malmberg and Sanford 1963).

1Ma222: Archaeological Investigations

Current Work: Site 1Ma222 was first discovered during our survey of the study corridor. It lies just west of the major access road to Bell Hill, south of Redstone Road, on a lower ridge slope to the east of a large plowed field (Figure 40). Sites 1Ma216, 1Ma217, and 1Ma218 were located in the same field. Following a general non-systematic surface reconnaissance of the area, an arbitrary center point was selected, and the systematic radials conducted.

Current Results: A total of twenty-four assorted historic artifacts were recovered in three areas of concentration within the site area. The majority, sixteen, were glass (Table 14). As the radials indicate (Figure 41), artifact density was generally low. The surface reconnaissance also failed to reveal the presence of any well, domiciliary, or support building, though several brick fragments were noted during the course of the reconnaissance and the radial collection. The appearance of the structure on the 1964 USGS map at the site location would appear to date the site to the recent period.

Sites of the Upland South of Huntsville Spring Branch Basin

1Ma162: Introduction and Topography

This small upland area is physiographically defined as the northwestern arm of a "Y"-shaped ridge complex (which also includes the uplands west of the Boundary Canal). The area includes only one site, 1Ma162, which is a two component site consisting of an historic occupation as well as a small, prehistoric occupation. The site covers a ridge nose and extends south and downslope along the top of the eastern bank of the Huntsville Spring Branch Basin (Figure 42). On the ridge nose, the site is approximately 80 meters (262.4 feet) distant from the basin floor, and lies some five meters (16.4 feet) above it. At the southern end, the site is adjacent to the basin, at a level one meter (3.28 feet) above it. Keyhole Lake, some 127 meters (393.7 feet) west of the site, was noted on the 1937 aerial photographs (Plate 36). It appears to be a spring-maintained lake in a sink, and was probably present during prehistoric times.

One of the three examples of colluvial stratification associated with a colluvial slope detected in this study was exposed in Backhoe

TABLE 14. ARTIFACTS RECOVERED FORM 1Ma222.

	Total Surface, Radials, & S. P.
HISTORIC	
Glass	
Unid. bottles	
Clear	12
Brown	1
Pane glass	2
Whole small ointment jar (automatic manufacture)	1
Ceramics	
Ironstone	
Undec.	2
Cup handle	1
Porcelain	
Undec.	1
Miscellaneous	
Flower pot fragment	1
Blue glass marble	1
Brick fragment	1
Whole brick	1
total	24

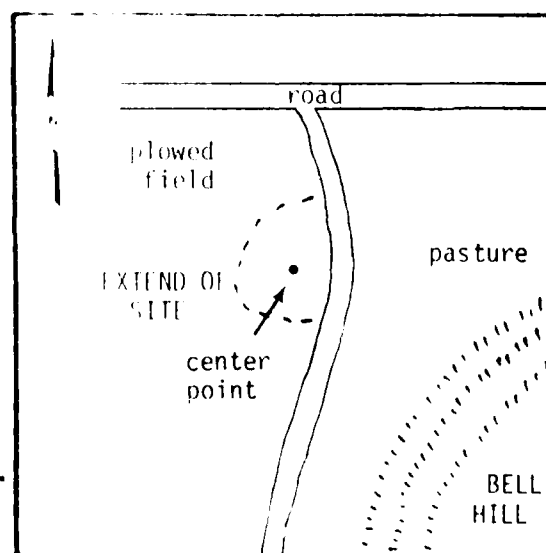


FIGURE 40. SKETCH MAP OF SITE 1Ma222.

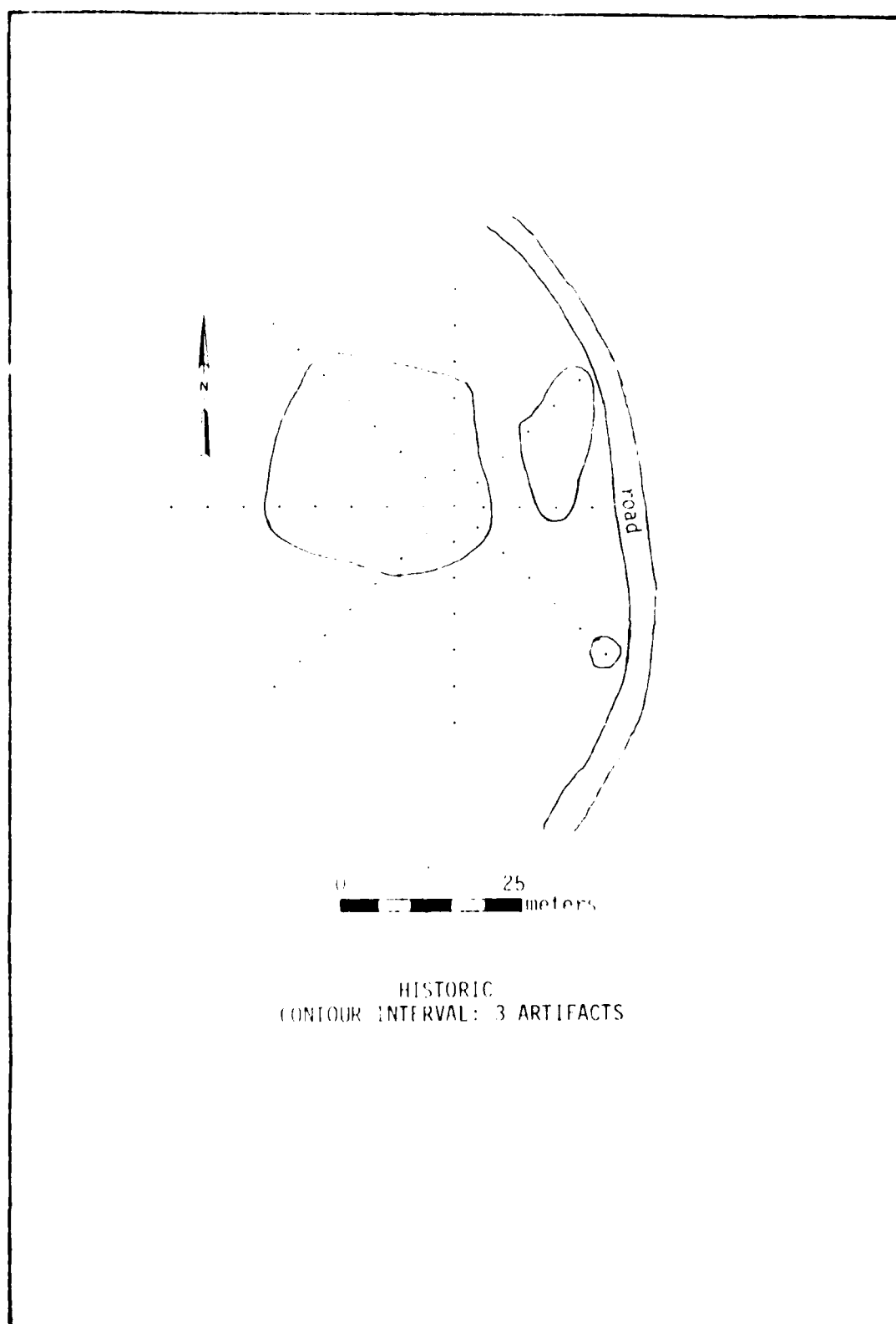


FIGURE 41. FREQUENCY CONTOUR MAP OF SITE 1Ma222 SHOWING RADIAL
TRANSECT GRID.

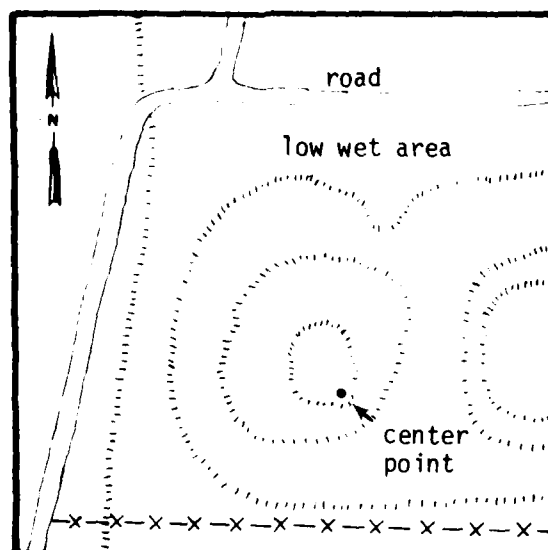


FIGURE 42. SKETCH MAP OF SITE 1Ma162.



PLATE 36. KEYHOLE LAKE TO THE WEST OF 1Ma162.

Trench II 22-5 (see Figure 16 for location). The trench was cut in the surface between the gentle lower slope of the ridge and the flat basin bottom, this surface slopes at approximately thirty per cent, and the midpoint of the trench was some one-half meter (1.64 feet) above the basin floor. An unconformity between the colluvial strata and underlying basin clay lies 1.1 meters (3.61 feet) below the trench midpoint. From the stratification exposed in the trench, the location of the site, and local elevations, it appears that the prehistoric basin floor was approximately 0.6 meters (1.97 feet) lower than at present. Although slope wash has removed much material from the ridge (perhaps twenty centimeters of soil on upper slopes) (Swenson et al. 1958), the form of the ridge is the same as it was during the prehistoric occupation, and the basin margin was probably no more than two meters (6.6 feet) east of its present position.

No lithic materials were available to the prehistoric inhabitants at the site. The nearest limestone outcrops with chert nodules on the east side of Huntsville Spring Branch are five kilometers (3.1 miles) to the northeast. However, the site's proximity to Keyhole Lake would have ensured that at least the historic occupants of the location had sufficient water for both cattle and agricultural production.

The ridge undulates, giving the impression of "knolls" upon the ridge, and it is on the first such undulation west of Keyhole Lake that the major portion of both the prehistoric and the historic occupations are defined. The site is located within the Redstone Arsenal, just northeast of the Thiokol Compound, in a locality currently used as pasture. Therefore, the majority of the site area has been disturbed by plowing and pasture seeding.

Previous Work: The site was revisited and recorded by Alexander (1979:134-135). He identified the site as two component, and indicated that the 1937 aerial photographs of the site location "illustrate a house and several outbuildings present" on the top of the knoll. It is in the same locality that the majority of the prehistoric artifacts identified by Alexander were recovered. The artifacts were non-diagnostic, and included a biface, three biface preforms, and several flakes and utilized flakes, in addition to several pieces of glass, and historic ceramic fragments.

Current Work: Prior to the initiation of the radials, a general non-systematic surface reconnaissance, which involved no collection, was made of the site locality. It appeared, from the reconnaissance, that the locations of the 1937 structures, and, presumably, the structures themselves, had been bulldozed clear, thereby possibly disrupting the subsurface integrity of both the prehistoric and the historic components. In addition, a recent borrow pit, situated approximately 80 meters (262.4 feet) northeast of the arbitrary site centerpoint, had possibly disturbed portions of the historic component, though that was not definitely determined during the course of the testing program.

The collection and site definition radials indicated that both occupations were, for the most part, confined to the ridge line, which trends basically east-northeast. Very little downslope movement of artifactual material was indicated (Figure 43). The site as a whole is 85 meters (278.9 feet) northeast-southwest, 45 meters (147.6 feet) east-west, and 45 meters (147.6 feet) north-south, with the primary concentration of prehistoric material occurring along the north and northeast radial lines. It should be pointed out, however, that only thirteen flakes of various types were recovered, and over two hundred historic artifacts were concentrated in the same areas and farther to the northeast and east. On the basis of the distribution of the prehistoric and historic artifacts, one test pit (Test Pit 1) was placed along the north radial, in an effort to define the prehistoric component; Test Pit 2 was situated in a high historic artifact density area, along the northeast radial.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below the surface. Two strata were defined in the unit. Stratum 1 is a reddish-brown (5YR 4/4) silty loam plowzone, which grades into the sub-plowzone, dark-reddish-brown (2.5YR 3/4) silty clay loam of Stratum 2. Though, from surface artifact counts, the placement of Test Pit 1 was within the area of highest prehistoric concentration, during the excavation of the unit, only three flakes were recovered, as opposed to twenty-nine pieces of historic material. While the artifact concentrations were highest in Stratum 1, material was also recovered in Stratum 2, as low as twenty-four centimeters (9.5 inches) below present ground surface. The occurrence of artifactual material at that level within Stratum 2 was not unexpected, as both Strata 1 and 2 were heavily disturbed by root activity.

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Two distinct strata were defined. Stratum 1 is a dark-reddish-brown (5YR 3/3) silty clay loam plowzone, with a maximum depth of 20 centimeters (7.9 inches). Only historic artifacts were recovered from the stratum, including historic glass, ceramics, and metal. Stratum 2 is a highly distinctive midden deposit, composed of a dark-reddish-brown (2.5YR 3/4) sandy clay loam. As illustrated in Figure 44, the stratum is subdivided into two substrata, the differentiation based primarily on the quantity and types of artifacts found. Stratum 2a contained a full range of historic artifactual material, while Stratum 2b is a pocket concentration of metal approximately 80 centimeters (31.5 inches) in width, with a maximum depth of 15 centimeters (5.9 inches). Although the midden zone continued, excavation was arbitrarily halted at 30 centimeters (11.9 inches) below ground surface, because of time considerations. Representative samples of midden fill were taken for further analysis.

Initially, a gradall cut was going to be made in order to determine the presence of intact subsurface features and the relationship of the prehistoric to historic components. However, inclement

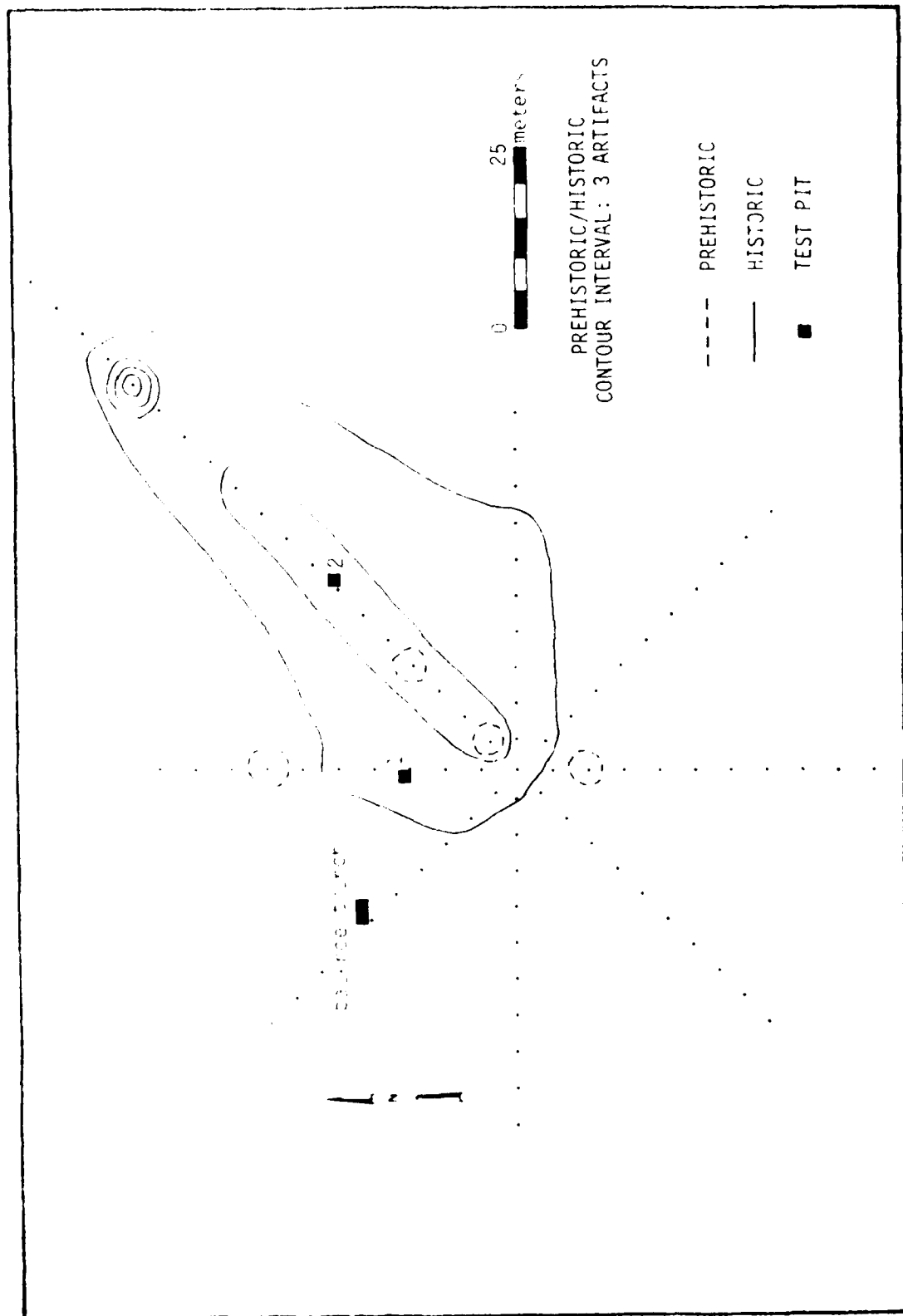
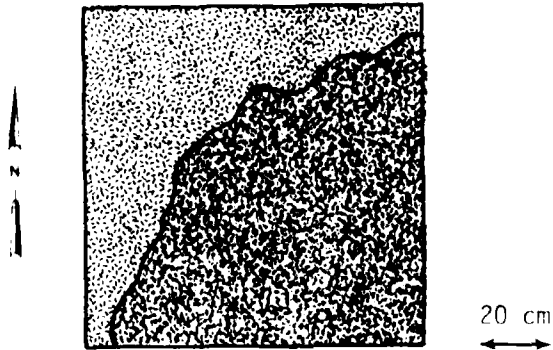


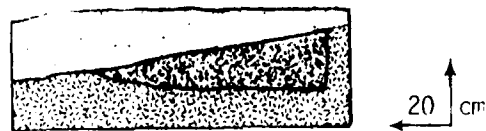
FIGURE 43. FREQUENCY CONTOUR MAP OF SITE 1Ma162 SHOWING RADIAL TRANSECT GRID, TEST PITS AND BACKHOE TRENCH

1Ma162

TEST PIT 2
PLAN VIEW
(base of level 2)



TEST PIT 2
SOUTH PROFILE



- Dark Reddish Brown, 5 YR 3/3, Silty Clay Loam
- ▨ Dark Reddish Brown, 2.5 YR 3/4, Sandy Clay Loam with a heavy concentration of burned metal and melted glass (Stratum 2b)
- ▩ Dark Reddish Brown, 2.5 YR 3/4, Sandy Clay Loam (Stratum 2a)

FIGURE 44. PLAN AND PROFILE OF TEST PIT 2 AT SITE 1Ma162.

weather, resulting in extremely muddy conditions, forced a cancellation of the grading procedure. The presence of the intact historic midden deposits, and the nature of the artifact assemblage, with its extensive representation of various historic artifact classes, does make the site potentially eligible for the National Register, and more extensive stripping is warranted.

As summarized above, the site is two-component, composed of a somewhat ill-defined prehistoric component, which yielded no diagnostic artifacts (Table 15), and an historic component indicating an occupation from the turn of the century into the 1930s (Plate 37). Historic confirmation of the latter occupation indicates use of the structure as late as 1937.

Site of the Uplands East and North of Huntsville Spring Branch Basin

Alexander (1979) recorded four sites on the low ridge crests which border the north end and east side of Byrd Spring Lake: 1Ma170, 1Ma182, 1Ma183, and 1Ma189. Only 1Ma182 fell within the boundaries of this investigation, and no new sites were detected.

1Ma182: Introduction and topography

Site 1Ma182 is on the crest and slope of a ridge nose (Figure 45). At the west end of the site is a narrow, north-south bottomland, which lies between the ridge nose and a low rise which contains site 1Ma183. The ridge nose rises to the east, into the steep, stony ridge that forms the northern margin of the Byrd Spring Lake Basin, part of the Huntsville Spring Branch Basin.

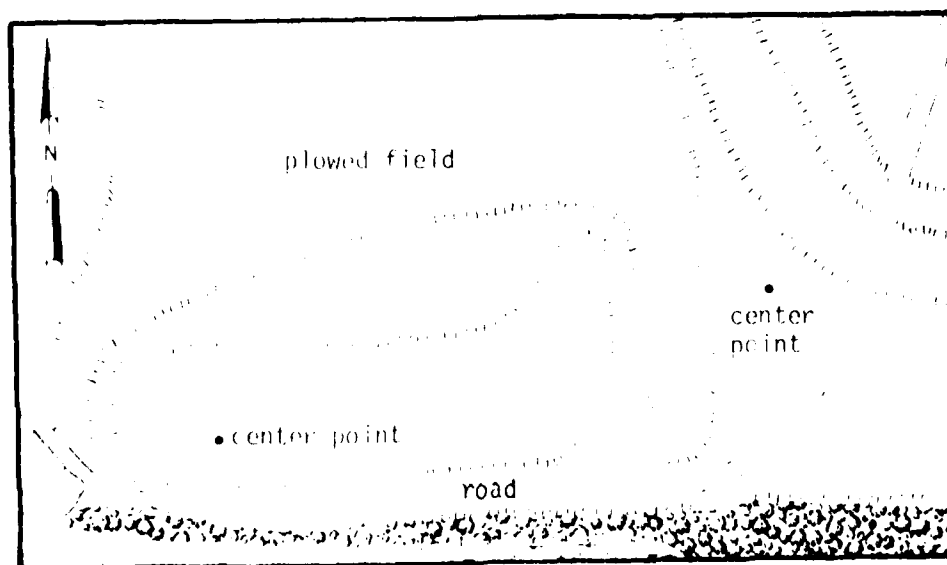


FIGURE 45. SKETCH MAP OF THE EASTERN AND WESTERN SECTIONS OF SITE 1Ma182.

TABLE 15. ARTIFACTS RECOVERED FROM MALOZ.

	Surface, Radiols, A.S.P.		I.P. 1	I.P. 2	Totals
LITHICS					
Chipped stone flakes, unmodified	3		1	1	4
Tertiary					
Flake frag., unmodified	4			1	4
Tertiary	1				2
Debris, unmodified	2		1		2
Debris, modified					1
Core, unmodified					
Total	3		2	2	13
HISTORIC					
Glass					
Pane glass			5	3	8
Milk glass	2				2
Medicine bottles - post 1920	2				2
Jars, other	1				1
Aqua	7				7
Soft drink					
Unid. bottles	3		4		7
Aqua	17		7	9	33
Clear	2		3	1	6
Brown				4	4
Green	1			19	20
Melted glass					
Ceramic					
Ironstone	7		4	2	13
Undec.	1		1		2
Blue					
Hotelware	1				1
Porcelain	1				1
Undec.					
Stoneware	1		1		2
Lead glaze					
Un glazed				1	1
Metal					
Iron					
Unid.	2			45	47
Small plate	1				1
Washers	3		1	22	25
Hinge element	1			1	2
Wire	1			53	54
Mod. wire nails	3		3	12	18
Iron					
Large staple			1		1
Wingnut				1	1
Twisted wire					
T-cross machine					
part				1	1
Machine part, unid.				1	1
Brass					
Plate				1	1
Copper					

Hotelware	1					
Porcelain	1					
Under	1					
Stoneware	1					
Lead plate	1					
Un glazed	1					
Metal						
Iron						
Unid.						
Small plate						
Washers						
Hinge element						
Wire						
Mod. wire nails						
Iron						
Large staple						
Wingnut						
Twisted wire						
T-cross machine						
part						
Machine part, unid.						
Brass						
Plate						
Copper						
Wire						
Tin alloy						
Can fragment						
Brad						
Cap fragment						
Miscellaneous						
Glass button fragment						
Ceramic drainage pipe						
Brick fragments						
Asphalt roof tile						
Ceramic light fixture						
fragment						
Graphite core						
Slate roofing tile						
fragment						
Total	63	30	203		296	

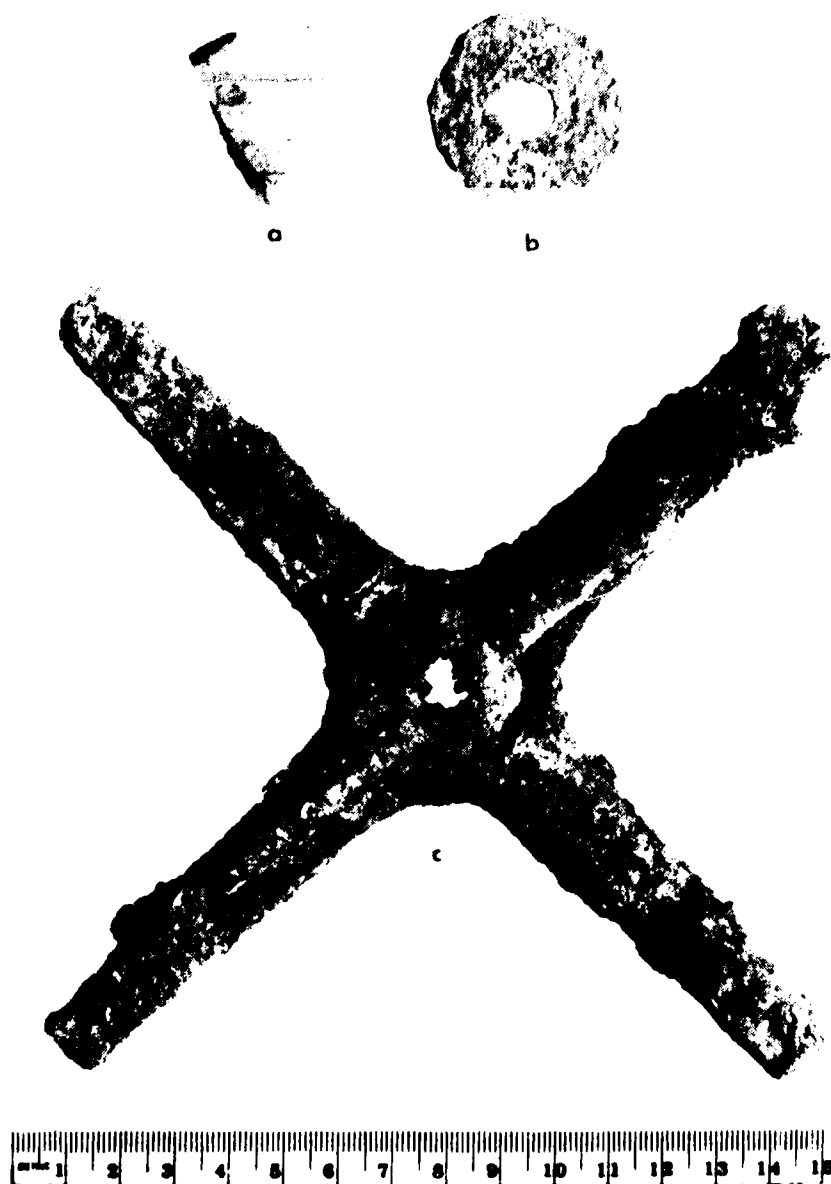


PLATE 37. HISTORIC ARTIFACTS FROM 1Ma162.
a Stoneware fragment, unglazed; b, Iron Washer;
c, T-cross machine part.

Slopes of the crest on which the site is located are one to two percent, increasing to fifteen percent along the southern side, down to the Byrd Spring bottomland. The nose crest is some forty meters (131.2 feet) north of the present edge of the bottomland. It appears that dirt scraped from the surface has been pushed onto the slope, artificially increasing it. Backhoe Trench II 22-9 exposed a one-meter thick (3.28 feet) section of colluvium over bottomland clay. If the colluvial layer is the product of slope wash since historic clearing of the land, the prehistoric northern boundary of the bottomland was probably three to five meters (9.8 to 16.4 feet) closer to the crest, and the prehistoric basin floor was 0.5 meters (1.6 feet) lower than at present.

Hillslopes become steeper, and rock outcrops begin, near the northwest corner of the Byrd Spring bottomland. The slope culminates in a nearly vertical outcrop of blocky and massive Tusculum limestone above the spring. Chert nodules weathered out of the limestone were found in the stony soils of slopes adjacent to outcrops. Maximum dimensions of these primary chert nodules were only a few centimeters, and no larger nodules were detected in the outcrops. Larger nodules (15 to 20 centimeters across) were found in the roadcrops some five hundred meters (1640 feet) north and northeast of site 1Ma183, where Martin Road crosses this dissected ridge. The chert of both the roadcrops and Byrd Spring is white-to-tan, tough, and brittle.

Byrd Spring and Byrd Spring lake, *sensu stricto* (the open-water strip at the base of the ridge, not the seasonally ponded, ephemeral lake), are long-lasting products of limestone solution and ground-water channel formation (see above, "Huntsville Spring Branch Basin"). These features, and the seasonal lake, were probably present throughout the time of prehistoric human occupations. Moreover, the dissected ridge contains abundant solution channels, which have several other openings on both sides of the ridge. During droughts, it is possible that caves could temporarily have been accessible to prehistoric inhabitants of the area along this ridge.

1Ma182: Archaeological Investigations

Previous Work: The site was originally reported by Blaine Ensor, in April, 1978, and, during Alexander's revisit to the Redstone Arsenal Area in September of the same year. His narrative, attached to the University of Alabama site survey form, indicates that the site is well-known to local collectors who have indicated the presence both of Paleo-Indian fluted points, and of early Archaic points from the site. Presumably on the basis of the informant information, Alexander indicates that the general cultural affiliations for the site are Paleo-Indian, Early Archaic, and Middle Archaic.

Current Work: As illustrated in Figures 46 and 47, the areal extent of 1Ma182 was much greater than originally indicated on the site survey form, where the site was judged to be 61 meters by 61 meters (200 by 200 feet). During the preliminary resurvey of sites

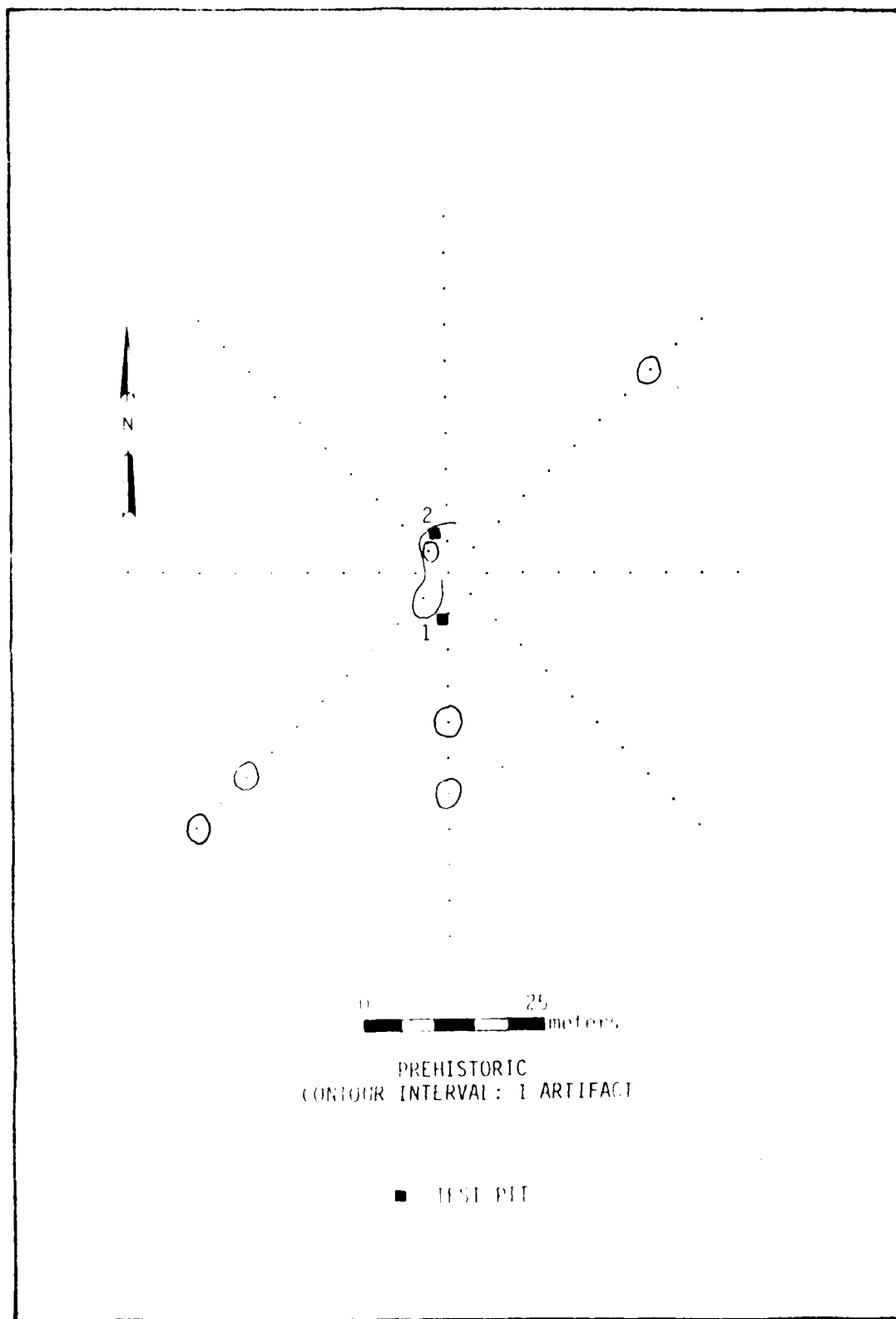


FIGURE 46. FREQUENCY CONTOUR MAP OF EASTERN PORTION OF SITE
1Ma182 SHOWING RADIAL TRANSECT GRID AND TEST PITS.

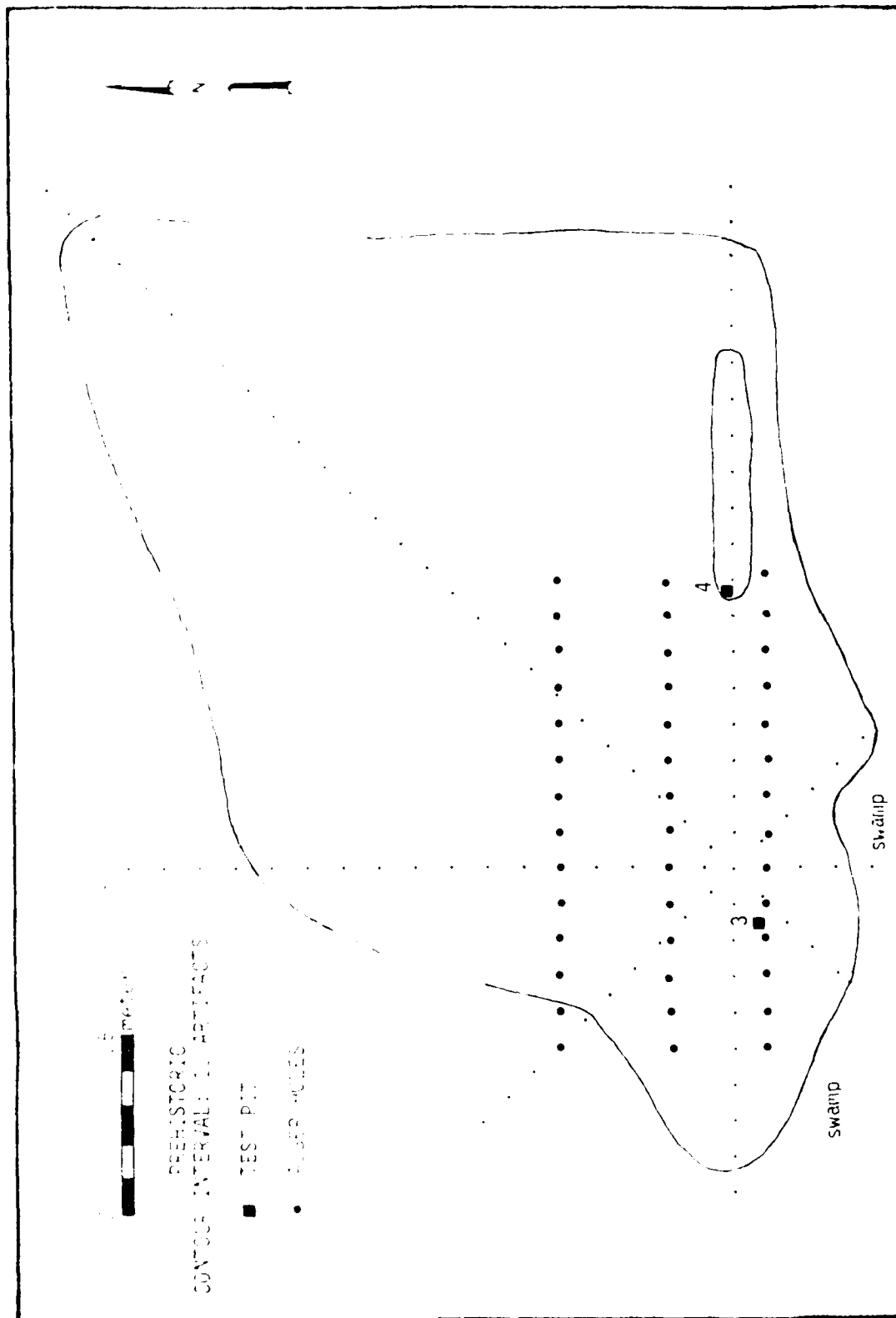


FIGURE 47 . FREQUENCY CONTOUR MAP OF THE WESTERN PORTION OF SITE 1Ma182 SHOWING RADIAL TRANSECT GRID, TEST PITS, AND AUGER HOLES.

to be tested during the NWR project, the extreme western portion of the site was designated 1Mal82, while the major concentration was designated 1Mal83. Between the radial and test pit procedure at "1Mal82," and the beginning of work on 1Mal83, it was discovered that both were, in actuality, 1Mal82, and that 1Mal83 is located to the southwest of the site, and separated from it by a pond and a portion of the Byrd Spring Lake. The initial error in location led to the ultimate excavation of four test pits within the 1Mal82 area, two in the western portion, and two in the extreme eastern portion.

The general surface reconnaissance, prior to the radial program, indicated that artifact density was much higher in the western half of the site. The western half of the site is separated from the eastern half by a slight depression and is currently in use as a corn field. The eastern portion of the site is, however, pasture grass, with low ground visibility.

Therefore, during the surface reconnaissance and radial collection program in the eastern portion, every five meters (16.4 feet) along the radial lines the surface grass was scraped away and hand-sorted. The resulting artifact densities were still quite low (Figure 46), in relation to the amount of surface material identified and counted during the radial program in the western portion of the site. Surface visibility was much greater, as noted previously, and the field was generally clear, though cornstalks, husks, and cobs were present. The radials conducted in the western portion (Figure 47) indicated that the majority of artifactual material was confined to the low ridge, with densities falling off appreciably toward the swamp on the south and downslope to the north, northwest, and, to a lesser extent, northeast. On the basis of both sets of radials, the site area encompassed 14,400 square meters (17,222 square yards). Test Pits 1 and 2 were situated in the extreme eastern portion of the site, in the low-density area, while Test Pits 3 and 4 were located in the higher-density western portion.

Current Results: Test Pit 1 was excavated in three arbitrary levels, to a depth of 30 centimeters (11.9 inches) below present ground surface. Only one stratum was defined, an undifferentiated sandy clay loam, 5YR 4/6, with numerous pieces both of limestone and of unworked chert. Eleven centimeters (4.3 inches) from the surface, in the northern half of the unit, a large limestone rock was encountered, which represented a segment of the outcropping limestone present throughout the area (Plate 38). Two flakes were recovered from the upper ten centimeters (3.94 inches) of the unit along with pieces of clay pigeons. (The latter are relatively common in the area, as the Byrd Spring Rod and Gun Club is directly south of the site location).

Test Pit 2, which was upslope from Test Pit 1, exhibited a much shallower soil profile, though two strata were present. Stratum 1 is identical to that recorded for Test Pit 1, while Stratum 2 is a slightly darker (7.5YR 4/4) silty clay. The unit was excavated in

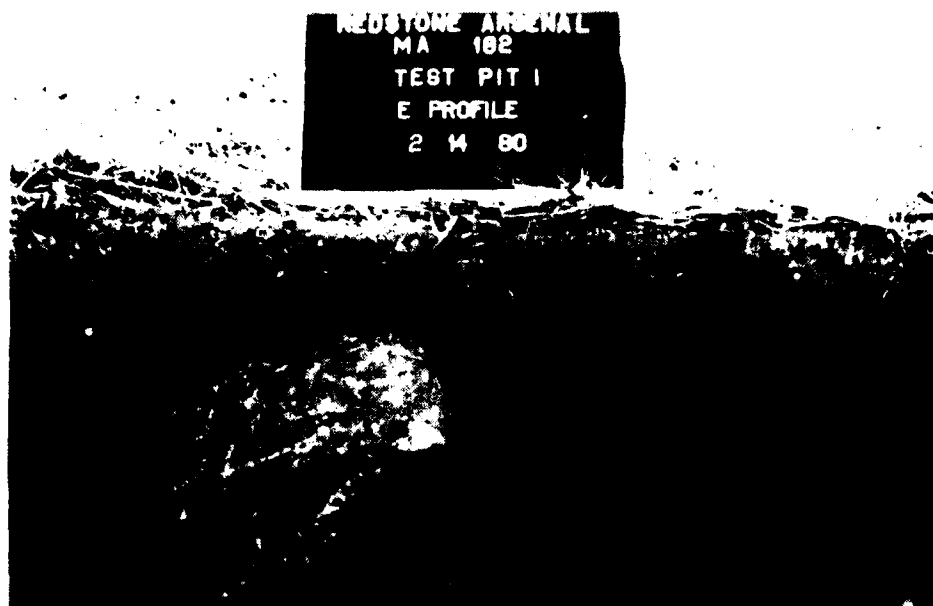


PLATE 38. IMA182 EASTERN SECTION TEST PIT 1 PROFILE.
THE LIMESTONE OUTCROP TO THE LEFT IS TYPICAL
OF THE MATRIX COMPOSITION OF THE EASTERN
SECTION OF THE SITE.

only two arbitrary levels to a depth of 20 centimeters (7.9 inches), due to the increasing amounts of fractured limestone and natural chert flaking, both of which increased in density in the lower levels of the unit. There was no differentiation in soil type or color in the lower levels. Three flakes were recovered in the upper ten centimeters (3.94 inches), and one possible flake from the lower level.

The units to the western side of the site exhibited much different profiles. Test Pit 3 was excavated in two arbitrary levels, to a depth of 20 centimeters (7.9 inches) below present ground surface. Two strata were defined in the unit. Stratum 1 is the disturbed plowzone, which, in the instance of Test Pit 3, averages 15 centimeters (5.9 inches) in thickness. The soil matrix is a sandy clay loam, reddish-brown (5YR 4/4). Stratum 2 is a red (2.5YR 4/6) undisturbed sub-plowzone sandy clay loam, which is sterile of artifactual material.

Test Pit 4 was excavated to a depth of 30 centimeters (11.9 inches) below present ground surface. As with Test Pit 3, two strata were defined. The two strata were identical to those in Test Pit 3 and, again, all artifactual material was confined to the upper stratum.

Following the test pit program, as an augmentation to the testing, a series of auger holes was placed within the western portion of the site. Three lines of holes, spaced at five-meter (16.4 feet) intervals, with each line separated by 15 meters (49 feet) from each other, were placed at the site, in an effort to determine the presence of subsurface midden or features. Neither were encountered during the augering program.

Although Alexander reports that local informants note the presence of Paleo-Indian remains at this site, our investigations found no evidence of activity earlier than the Late Woodland (Table 16). Our data are based on the presence of Mulberry Creek Plain ceramics and a Hamilton projectile point (Plate 39). Artifact density points to a rather intense occupation of the site during this period.

Sites of the Huntsville Spring Branch Basin

1Ma183: Introduction and Topography

The long, elongated rise bearing this site borders the northwestern side of Byrd Spring Lake bottomland (Figure 48). The upper slopes and crest of this rise are approximately 80 meters (262.4 feet) across, and gentle slopes lead down to the lake basin and westward to a drainage swale. Elevation of the rise crest is approximately one meter (3.28 feet) greater than that of the present lake bottom. Backhoe Trenches I 25-11 and II 25-3 penetrated soils mapped as similar to the soil of the rise at 1Ma183: Etowah silt loam (defined by Swenson et al., 1958, as occurring on "low, young stream terraces"). The two trenches encountered angular pieces of secondary chert, affirming the stability of the rises developed on the material, at least during the prehistoric occupations.

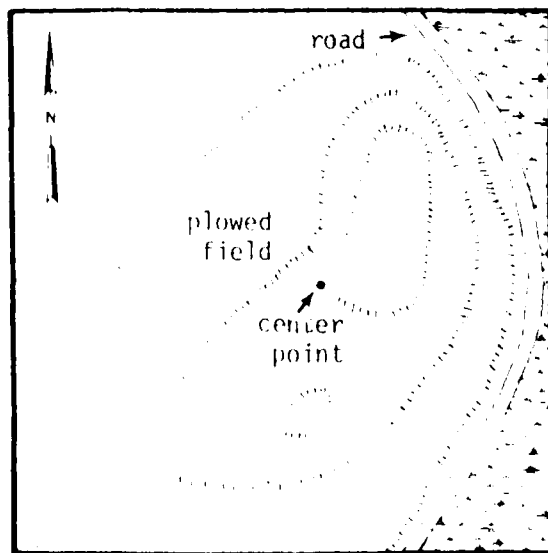


FIGURE 48. SKETCH MAP OF SITE 1Ma183.

TABLE 16. ARTIFACTS RECOVERED FROM TMA182.

	Surface, Radials, & S.P.	I.P. 1	T.P. 2	T.P. 3	T.P. 4	Totals
CERAMICS						
Mulberry Creek plain						
Total						
1					1	1
1					1	1
LITHICS						
Chipped stone						
Primary form	2					2
Flakes, unmodified	8					8
Primary	22					22
Secondary	88					88
Tertiary	1	1	1	2	8	32
Flake frag., unmodified				12	46	149
Primary	5					5
Secondary	5			1	2	8
Tertiary	2	2	2	13	101	225
Debris, unmodified	3	8	6	9	28	124
Flakes, modified						
Primary	1				1	2
Secondary	1				2	3
Tertiary	2			1	2	5
Flake fragments, modified						
Primary	1					1
Secondary	1			1	1	3
Tertiary	1			1	1	3
Core, unmodified	3				3	16
Core, modified						
Blade					1	1
Unifacial tools						
End scraper on a flake	1			1		2
Side scraper	1					1
Notched flake	1					1
Graver	2					2
Unid. frag., no apparent usage						
Bifacial tools						
Knife fragment						
Backed side scraper	2				1	3
Unid. frag., with scraping use	1					1
Unid. frag., no apparent usage						
Projectile points	2				1	3
Knife/proj. pt. frag.					2	2
Hamilton	1				1	2
Unid. proj. pt.	1					1
Total	10	11	10	41	200	607



PLATE 39. LITHIC ARTIFACTS FROM 1Ma180, 1Ma183, AND 1Ma182.
 1Ma180: a Catahoula/Garth Slough(?); b, McIntire;
 c, Bifacial Preform; d, Backed Side Scraper from
 a broken Biface.
 1Ma183: e, Copena Triangular base.
 1Ma182: f, Hamilton; g, Unifacial Graver.

A drainage swale separates the rise containing 1Ma183 from the ridge nose to the northeast, which contains 1Ma182. The formerly natural stream in this swale drains a small area of the dissected, Tusculmbia limestone ridge, which forms the northern and eastern boundaries of Huntsville Spring Branch Basin. West and southwest of the rise is a narrow swale, then a broad expanse of flat bottomland (with Robertsville soil), which contains other low rises.

If the prehistoric inhabitants were using primary Tusculmbia chert, they could have obtained nodules from outcrop areas in the ridge, 600 to 700 meters (1968 to 2296 feet) to the northeast. Although not detected by this investigation, other sources of local chert could have been found in the ridge above Byrd Spring, 500 meters (1640 feet) to the east.

Several sources of water and water-related resources were present during prehistoric times. Backhoe Trench II 22-9 showed that the prehistoric lake bottom was probably 0.5 meters (1.64 feet) lower than at present; lake waters, now restricted to the eastern margin of the bottomland, might have spread across its entire 300-meter (984 feet) width. At the least, a swamp similar to the present one, and possibly less seasonally dry, would have been present. The stream around the northern and western sides of the rise probably carried enough water from the ridge to maintain a permanent flow in a channel. Lastly, the Robertsville soil area could have been moist enough to form marshland at some times during the period of prehistoric human occupations.

1Ma183: Archaeological Investigations

This site is in close proximity to 1Ma182. The differentiation in topographic and geologic setting between the two sites does not appear to have altered the historic land-use pattern appreciably. The site, as with 1Ma182, is currently planted in corn, and appears to have been cultivated for some years.

Previous Work: Reported by Blaine Ensor in 1978, the site was recorded by Alexander later that same year. According to the University of Alabama site survey form, the site covers approximately one acre, though, in the narrative attached, the dimensions are listed as 100 meters (328 feet) north-south, and 50 meters (164 feet) east-west. Presumably on the basis of diagnostics recovered either during the Ensor or the Alexander visit, the general cultural affiliations for the site are listed as Middle and Late Archaic, and possibly Woodland.

Current Work: A general surface reconnaissance of the site locality was made prior to the radial program, in order to determine the placement of the arbitrary centerpoint. As illustrated in Figure 49, the radials indicated that the primary occupation was confined to the ridge crest. Road disturbance along the eastern and northern sides of the site may have altered the dimensions of the site slightly. On the basis of the radial results, the site encompasses

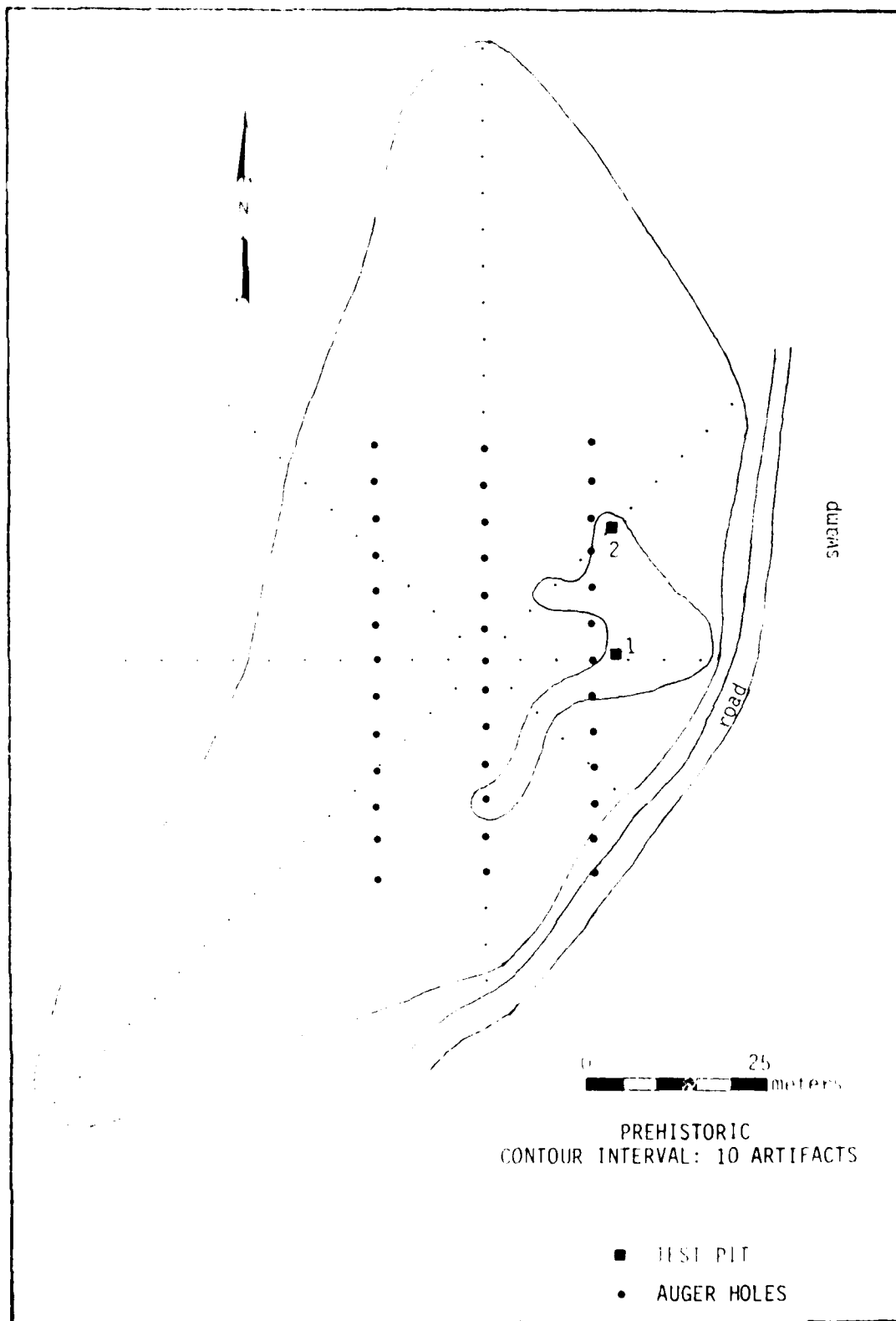


FIGURE 49. FREQUENCY CONTOUR MAP OF SITE 1Ma183 SHOWING RADIAL TRANSECT GRID, TEST PITS AND AUGER HOLES.

9,300 square meters (11,122 square yards). The only diagnostic recovered from the site, a Copena Triangular, was recovered during the radial procedure. On the basis of the radial data, test pits were placed in high-artifact-density locations.

Current Results: Test Pit 1 was excavated in three arbitrary levels, to a depth of 30 centimeters (11.9 inches). Two strata were defined. Stratum 1 is a silty clay loam plowzone, dark-reddish-brown (5YR 3/3), averaging 24 centimeters (9.4 inches) in depth. All artifactual material recovered in the unit came from Stratum 1, and included the distal fragment of a projectile point. Stratum 2 is a red (2.5YR 4/6) silty clay loam, undisturbed, sub-plowzone-level.

The profile for Test Pit 2 was identical to that in Test Pit 1, though the plowzone stratum reached a maximum depth of 30 centimeters (11.9 inches) in the east-central portion of the unit. Again, the artifactual material was confined to Stratum 1, and included three distal fragments of projectile points, and a piece of historic glass.

In order to determine if subsurface features or midden were present at the site, a series of auger holes was placed, running north-south, across the medial section of the site. As with other augering procedures, the auger lines were spaced 15 meters (49 feet) apart from one another, with each hole separated by five meters (16.4 feet) along the lines. The augering program revealed no evidence of subsurface midden or features.

The single diagnostic Copena Triangular point suggests an affiliation of Early Woodland for the site (Table 17 and Plate 39). In general, artifact density was relatively high and included a substantial quantity of flakes and cores, and, although tools were not well-represented, both bifacial and unifacial specimens were found in the collection. Although the site was reported as dating to the Middle and Late Archaic, our data reveal no evidence to substantiate occupation during these periods.

1Mal80 and 1Mal81: Introduction and Topography

These two sites lie on the gently curving, western margin of an area of low-relief rises and swales, on Etowah and other soils (Figures 50 and 51, Plate 40). West of this area, and some 0.5 meters (1.64 feet) below it in elevation, is the bottomland of Huntsville Spring Branch, here less than 800 meters (2,624 feet) wide. Both sites lie above, and adjacent to, accurate, gentle slopes, which mark banks cut into the higher ground by former meanders of the Huntsville Spring Branch. In particular, 1Mal80 follows this arc for several hundred meters. No evidence was discovered of overbank deposits on the higher ground, although the overbank deposits would have been obscured by plowing. The Etowah soils elsewhere have been found to be formed on in situ weathering products of bedrock. In brief, the terrain on which sites 1Mal80 and 1Mal81 were found is not a relict natural levee of the branch.

TABLE 17. ARTIFACTS RECOVERED FROM 1Ma183.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Primary form			1	1
Flakes, unmodified				
Primary	3			3
Secondary	11		1	12
Tertiary	93	7	28	128
Flake frag., unmodified				
Primary	1		1	2
Secondary	3		1	9
Tertiary	155	13	30	198
Debris, unmodified	41	18	33	95
Flakes, modified				
Primary	2			2
Secondary	1			1
Tertiary	3	1		4
Flake fragments, modified				
Tertiary	1			1
Debris, modified	3			3
Core, unmodified	13		2	15
Unifacial tools				
Notched flake	1			1
Unid. frag.			1	1
Bifacial tools				
Large flat flake	1			1
Unid. frag., no apparent use		1		1
Projectile points				
Open triangular	1			1
Knife/proj. pt. frag.	2	1		3
Groundstone				
Battered pebble			1	1
Small battered cobble		1		1
Total	343	42	99	484
METAL				
Glass				
Ind. bottle, clear			1	1
Total			1	1

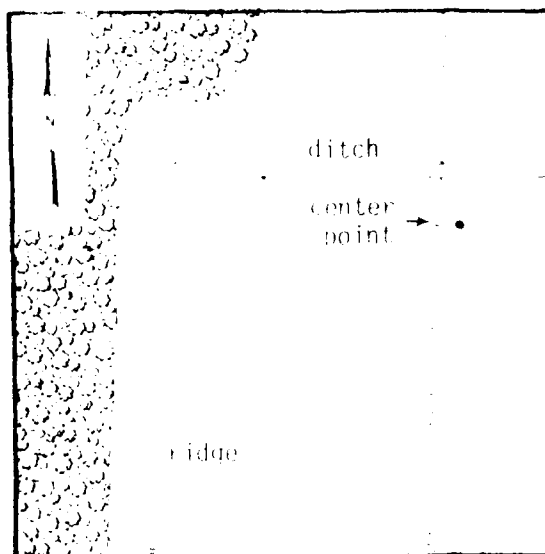


FIGURE 50. SKETCH MAP OF SITE 1Ma180

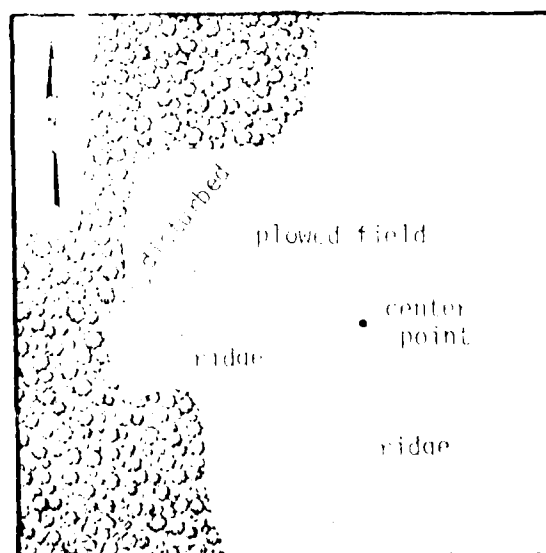


FIGURE 51. SKETCH MAP OF SITE 1Ma181

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WATER AND AIR RESEARCH INC GAINESVILLE FL
CULTURAL RESOURCES INVESTIGATIONS AT REDSTONE
1980 P M THOMAS, J H ALTSCHUL

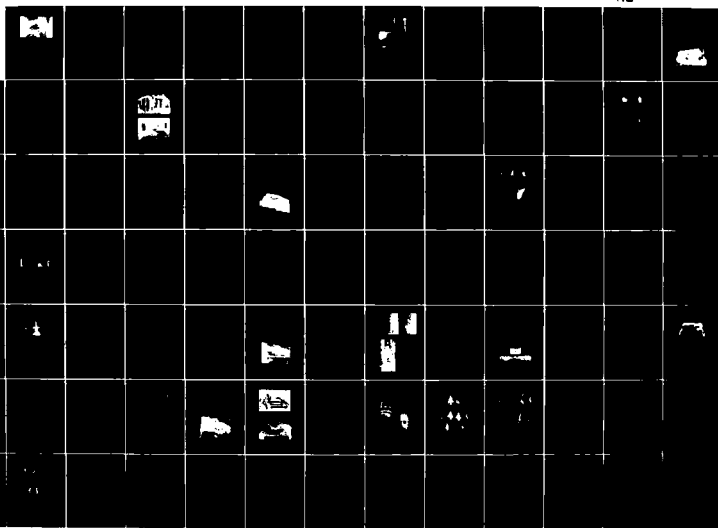
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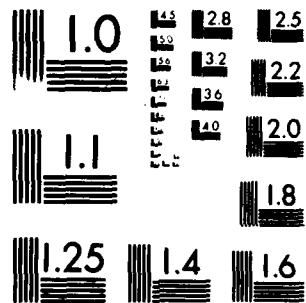
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MICROCOPY RESOLUTION TEST CHART
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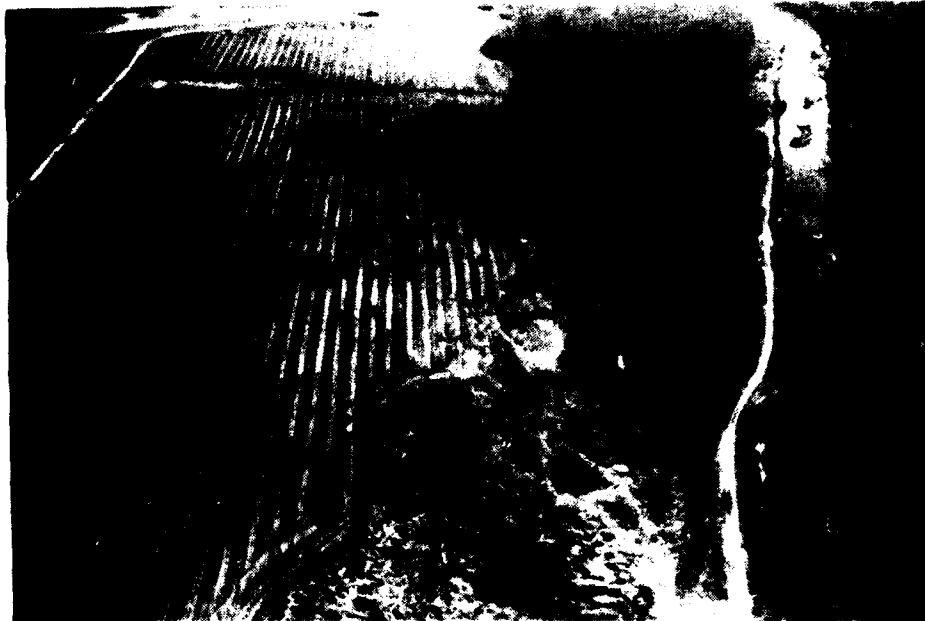


PLATE 40. AERIAL VIEW OF HUNTSVILLE SPRING BRANCH SHOWING THE EFFECTS OF CHANNELIZATION AND LAND CLEARING. 1Ma180 AND 1Ma181 ARE LOCATED IN THE FIELD TO THE LEFT.

To the north and northeast, the land rises gradually for two kilometers (1.2 miles) to the slopes of a dissected ridge on Tusculmbia limestone, which extend across the northeastern margin of the Huntsville Spring Branch Basin. Nodules of tough, tan-to-white chert, to 20 centimeters (7.9 inches) across, were collected from this ridge, 3.5 kilometers (2.1 miles) northeast of the sites. However, outcrops extend to within 1.7 kilometers (1.1 miles) north of the sites. Chert nodules might also have been present in the gravel bars in Huntsville Spring Branch.

There is no evidence that portions of the sites were removed by post-occupation meander cutting by Huntsville Spring Branch. It is reasonable to hypothesize that the prehistoric population settled on the bank of the river after the arcs had been cut, and, perhaps, after the meander channels had been abandoned.

1Ma180: Archaeological Investigations

Previous Work: The site was recorded by Alexander in the autumn of 1978. The site area had been recently harvested and plowed, and site size is indicated on the University of Alabama site survey form as from one to five acres (.4 to 2 hectares). The presence of large,

limestone slabs on the surface led Alexander to conclude that the plowing may have disturbed subsurface features of some type. Artifact density is considered to be heavy, with the majority of material listed as lithic waste on the site survey form. Presumably on the basis of diagnostic artifacts viewed or collected in the field, the general cultural affiliations for the site are listed as Transitional Paleo-Indian, Early Archaic, Middle Archaic, Early Woodland, and Middle Woodland.

Current Work: On the basis of data supplied by Alexander as to the site location, a radial procedure was conducted at the site, following a general surface reconnaissance. As illustrated on Figure 52, surface artifact densities were quite low, and it was initially felt that the lack of recent plowing and ground disturbance had influenced the results of the surface collection procedure. As defined following the radial procedure, the site was 150 meters (492 feet) north-south, and 100 meters (328 feet) east-west. The test pits were located in high-density locations along the north-south radial line.

Current Results: Test Pit 1 was excavated in three and one-half arbitrary levels, to a depth of 35 centimeters (13.8 inches) below present ground surface. Two strata were defined within the unit. Stratum 1 is a silty loam reddish-brown (5YR 4/4) plowzone, approximately 26 centimeters (10.2 inches) in depth. Somewhat surprisingly, no artifactual materials were recovered from the stratum. The underlying Stratum 2 is a silty loam, yellowish-brown (5YR 4/5). Small bits of metal were encountered in the stratum; however, attempts to excavate through or farther into the stratum failed when the water table was encountered at 35 centimeters (13.8 inches).

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Two distinct strata were encountered. Stratum 1 is a silty loam plowzone, reddish-brown (5YR 4/4), which yielded four artifacts, all flakes. Stratum 2 is clearly delineated from Stratum 1, and is a reddish-brown (2.5YR 4/4) silty clay loam or clay loam, which was sterile of artifactual material.

Because of the low artifact counts from both test pits, and the low surficial artifact density as defined by the radial procedure, it was decided to institute an augering program in the southwestern section of the site. The southwestern section encompassed a slight rise, which, during the general surface reconnaissance of the site, appeared to have more surficial artifacts than the lower portions of the area. Three 15-meter (49 feet) interval lines, composed of a series of auger holes spaced at five-meter (16.4 feet) intervals, were placed in the section. However, no subsurface features or middens were encountered in the augering program.

The artifactual material from this site was relatively light (Table 18), and all is confined to the plowzone. Diagnostics indicate Paleo-Indian and Late Archaic occupations at the site (Plate 39).

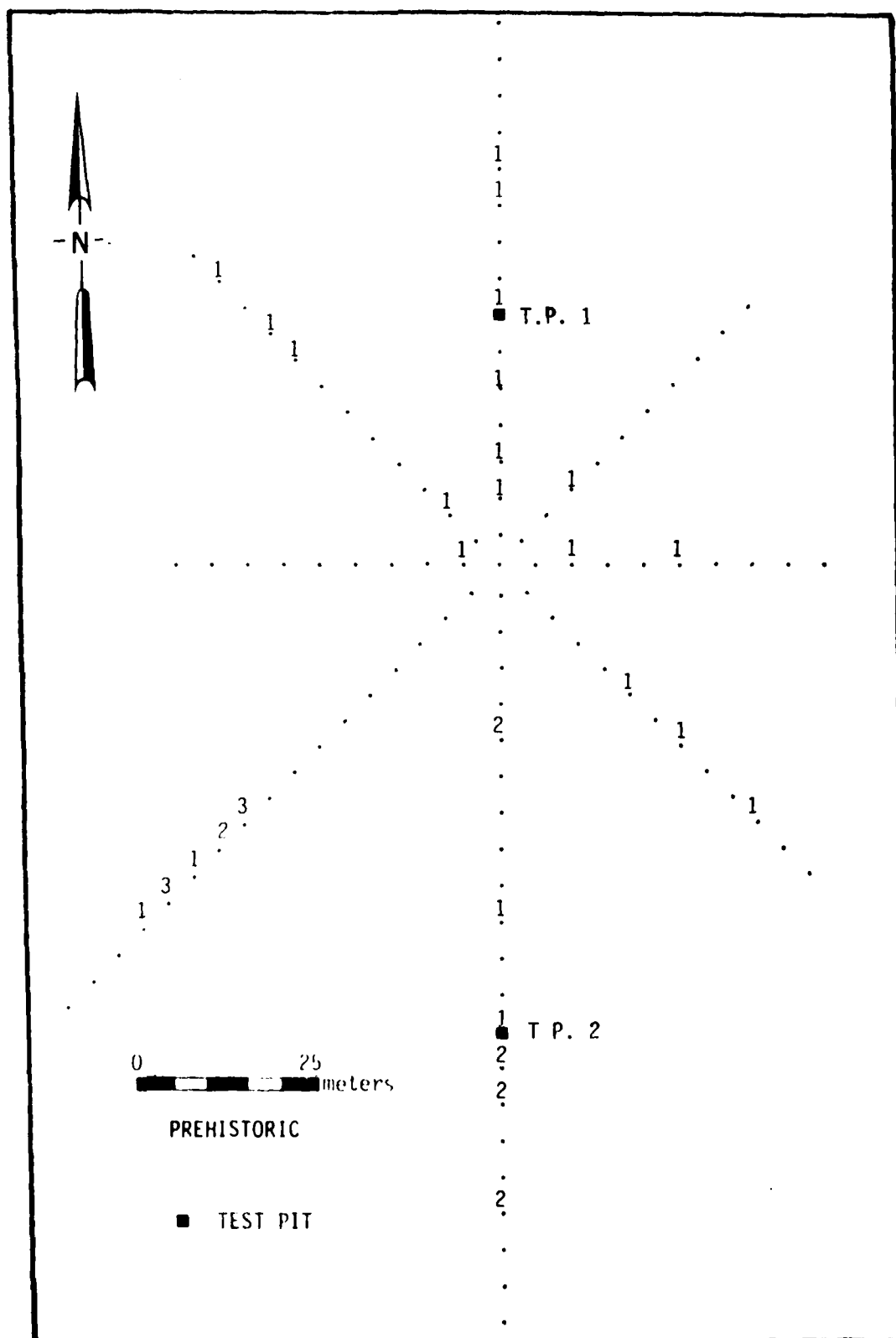


FIGURE 52. MAP OF SITE 1Ma180 SHOWING FREQUENCIES OF ARTIFACTS RECOVERED FROM RADIAL TRANSECTS AND LOCATION OF TEST PITS.

TABLE 18. ARTIFACTS RECOVERED FROM 1Ma180.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Primary form	1			1
Flakes, unmodified				
Secondary	2			2
Tertiary	3			3
Flake frag., unmodified				
Tertiary	8			8
Debris, unmodified	14		3	17
Flakes, modified				
Secondary	1			1
Tertiary	1		1	2
Flake fragments, modified				
Tertiary	2			2
Debris, modified	1			1
Core, unmodified	4			4
Core, modified	2			2
Unifacial tools				
Side scraper	1			1
Bifacial tools				
Large flat ovate	1			1
Small flat ovate	3			3
Scraper	2			2
Preform	2			2
Unid. frag., scraping use	1			1
Punch/graver	1			1
Projectile points				
Knife/proj. pt. frag.	1			1
Garth Slough	1			1
Cataco Creek	1			1
Unidentified	1			1
Total	54		4	58

1Ma181: Archaeological Investigations

1Ma181 is situated in the same field as 1Ma180, which is located 234 meters (768 feet) south-southwest. 1Ma181 has apparently been disturbed along its western margin by a borrow pit (Figure 51).

Previous Work: The site was originally reported in the spring of 1978, and recorded by Alexander later that year. He indicates that the site is a small lithic scatter, measuring about 15.5 meters by 15.5 meters (50 by 50 feet) and is of undetermined cultural affiliation.

Current Work: As with 1Ma181, surface artifact densities based on the results of the radial procedure were low (Figure 53). A general surface reconnaissance of the site area was instituted prior to the radial procedure, and indicated there were localized concentrations of the artifactual material, but, taken as a whole, the site was typified by low frequencies. As determined by the radial procedure, 1Ma181 encompasses 850 square meters (1,016 square yards). In addition to prehistoric artifactual material, one piece of lead mat-glaze stoneware was recovered during the boundary identification procedure (Plate 41). The low artifact frequencies resulted in the placement of one test pit (Test Pit 1) along the west radial, in an area of relatively high frequency, and the second unit ten meters (32.8 feet) west of the south radial, on a slight rise, in the vicinity of one of the localized artifactual concentrations.

Current Results: Test Pit 1 was excavated in three arbitrary levels, to a depth of 30 centimeters (11.9 inches) below present ground surface. Three strata were defined during the excavation. Stratum 1 is a silty loam plowzone, reddish-brown (5YR 4/4), with a low artifact frequency. Stratum 2, also disturbed by plowing, is a mottled silty clay loam, reddish-brown (5YR 4/4), with black (5YR 2.5/1) and reddish-gray (5YR 5/2). There is an increase in artifact frequency, all prehistoric, but there is no indication that the lens represents a midden level. The underlying Stratum 3 is a yellowish-red (5YR 5/6) sandy clay loam, which is undisturbed by plowing. One metal peg (Plate 41) and three lithics were recovered from the stratum (Table 19).

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches). It, too, exhibited three natural strata, though the location of the unit on a slight natural rise resulted in color differentiation from the three strata described in Test Pit 1. Stratum 1 is a reddish-brown (5YR 4/3) silty loam plowzone, which grades into Stratum 2. Stratum 2, also disturbed by plowing, is the same reddish-brown (5YR 4/3) silty loam; however, it is mottled with reddish-yellow (5YR 6/6) speckling. Both lenses exhibited about the same artifact frequencies, and all material recovered was prehistoric. The underlying Stratum 3, a 5YR 6/6 sandy clay loam, revealed a lower artifact density, with a complete absence of material below 25 centimeters (9.8 inches).

No additional subsurface tests were conducted at the site, because of the extremely muddy conditions and the low artifact densities. Clearly, this site represents only a light lithic scatter in which materials are confined to the plowzone. No diagnostics were recovered so only a general prehistoric date of occupation can be attributed to the site.

1Ma211, 1Ma213, 1Ma214, and 1Ma215: Introduction and Topography

The four sites are on a long, southeast-trending rise, which is continuous, to the north, with that at 1Ma180 and 1Ma181. However,

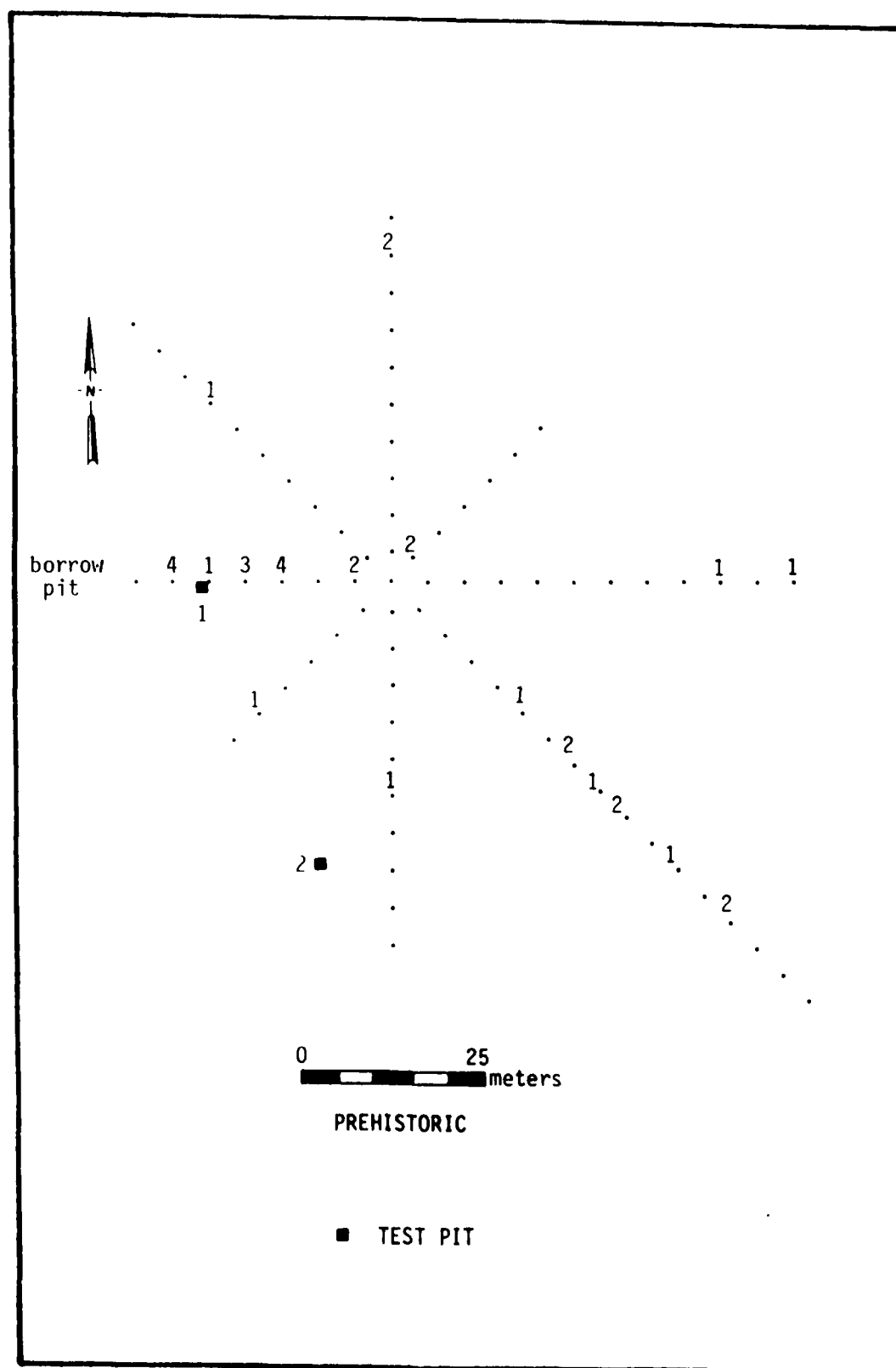


FIGURE 53 . MAP OF SITE 1Ma181 SHOWING FREQUENCIES OF ARTIFACTS
RECOVERED FROM RADIAL TRANSECTS AND LOCATION OF TEST PITS.



PLATE 41. HISTORIC ARTIFACTS FROM 1Ma213, 1Ma181, AND 1Ma215.
 1Ma213: a, Ironstone fragment, blue annular decoration;
 b, Leg of a Ceramic Figurine.
 1Ma181: c, Iron Peg; d, Stoneware fragment, mat glaze.
 1Ma215: e, Ironstone fragment, green shell-edged rim;
 f, Jar basal fragment, automatic manufacture.

TABLE 19. ARTIFACTS RECOVERED FROM 1Ma181.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Primary form	1			1
Flakes, unmodified				
Primary	2	1	2	5
Tertiary	8	4	9	21
Flake frag., unmodified				
Tertiary	1	2	9	12
Debris, unmodified	8		5	13
Flakes, modified				
Tertiary	1			1
Debris, modified	1	1		2
Core, unmodified	3		1	4
Unifacial tools				
Unid. frag.		2		2
Graver			1	1
Bifacial tools				
Unid. frag., no apparent use	1		1	2
Punch/graver	1			1
Unid., w/heavier use than T10 *	2			2
Groundstone				
Small battered cobble	1			1
Battered pebble/small cobble fragment	1			1
Battered pitted cobble	2			2
Total	33	10	28	71
HISTORIC				
Ceramic				
Stoneware mat glaze	1			1
Metal				
Peg		1		1
Total	1	1		2

* T10 - Unidentified fragment with scraping use.

this rise diverges from the narrow, present Huntsville Spring Branch bottomland. It is surrounded on three sides by flatland with Robertsville soils, with an elevation difference of nearly one meter (3.28 feet). The rise crest undulates gently, with approximately 0.5 meters (1.64 feet) of local relief. In prehistoric and historic times, the rise was probably as it is now, slightly higher ground above flat, wet terrain (which might have contained marsh or swamp vegetation at various times).

Local chert might have been available in gravel bars in the branch channel, no more than one kilometer (0.67 miles) to the west, perhaps through a swamp. Chert nodules could also have been collected from the dissected Tusculumbia limestone ridge, no closer than four kilometers to the north.

Each of the four sites was recorded during the project survey of selected areas within the test corridor. The rise on which the sites are located had been cultivated, and, with the exception of the immediate vicinity of 1Ma215 and 1Ma213, was clear of ground cover. The area around 1Ma215 and 1Ma213, both historic sites, was lightly grass-covered. However, inhibiting factors to surveying were muddy conditions and a slight dusting of snow, the latter necessitating a revisitation to the site localities.

1Ma215 is the northernmost of the four sites, and is separated from the remaining three by the major paved access road into the area. The other three sites lie to the south of the road, and are separated from one another by approximately 400 meters (1,312 feet). 1Ma211, the first site immediately south of the paved access road, is the only pure prehistoric site. 1Ma214, approximately 350 meters (1,148 feet) south-southeast of 1Ma211, is a two-component prehistoric/historic location. Both 1Ma215 and 1Ma213 are historic.

1Ma211: Archaeological Investigations

Current Work: Following a general non-collection surface reconnaissance of the site area, a systematic radial program was conducted from an arbitrarily selected centerpoint (Figures 54 and 55). Artifact densities were generally low, with the high count for any collection square being three flakes. Nonetheless, it is apparent from the radials that the major concentration of artifactual material lies to the east of the centerpoint, with the site configuration basically an oval, oriented along its long axis 60 meters (197 feet) east-west, and, on its short axis, 30 meters (98 feet) north-south.

Current Results: The artifact assemblage is typified by secondary and tertiary flakes and tertiary flake fragments. Two possible tools, a modified tertiary flake and a denticulate flake, were identified. The only diagnostic artifact recovered is a White Springs-like projectile point. The White Springs-like point would place the occupation of the site in the Middle Archaic; however, such a general cultural affiliation must remain tentative, because of the lack of confirming

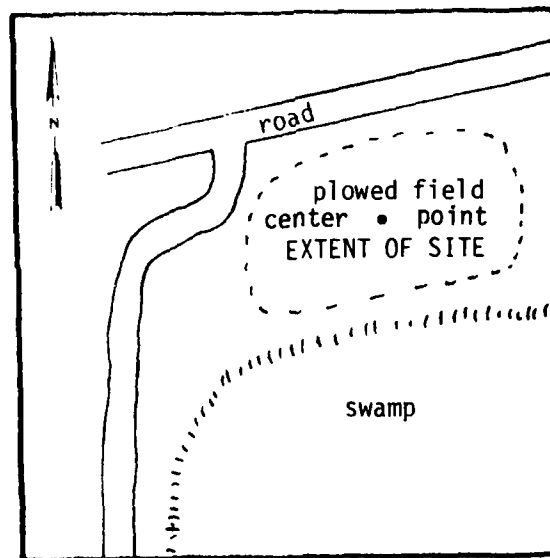


FIGURE 54. SKETCH MAP OF SITE 1Ma211.

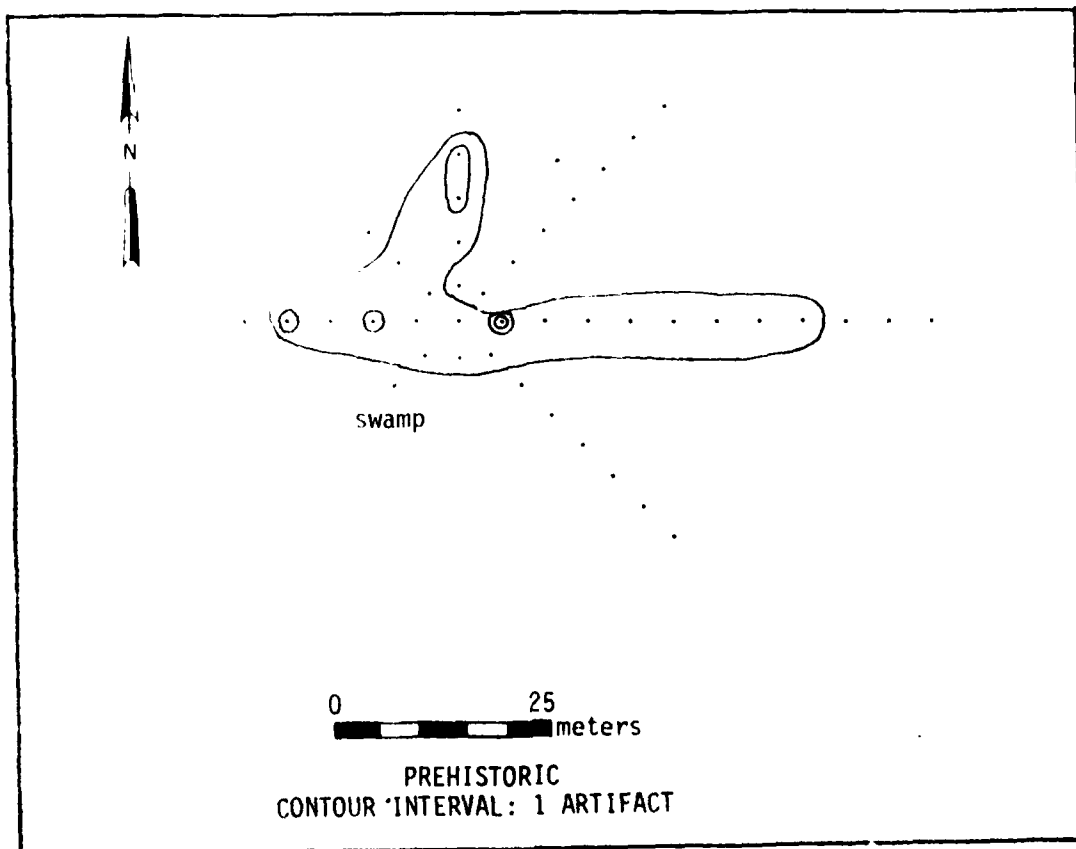


FIGURE 55. FREQUENCY CONTOUR MAP OF SITE 1Ma211 SHOWING RADIAL TRANSECT GRID.

data. Taken as a whole, the site would appear to be a lithic scatter, exhibiting a range of artifacts indicative of tool modification and/or preparation.

1Ma213: Archaeological Investigations

Current Work: The site was originally identified on the Huntsville 7.5' quadrangle sheet as a standing structure. The Huntsville map is dated 1975 and the site is situated off and to the east of Redstone Arsenal, therefore residence could have been ongoing as late as that date if not later. The house locality was visited and recorded during the survey (Figures 56 and 57; Plate 42), and radials were conducted using the house as a centerpoint.

Current Results: The radials indicated that the site area encompassed approximately 2,000 square meters (2,300 square yards).

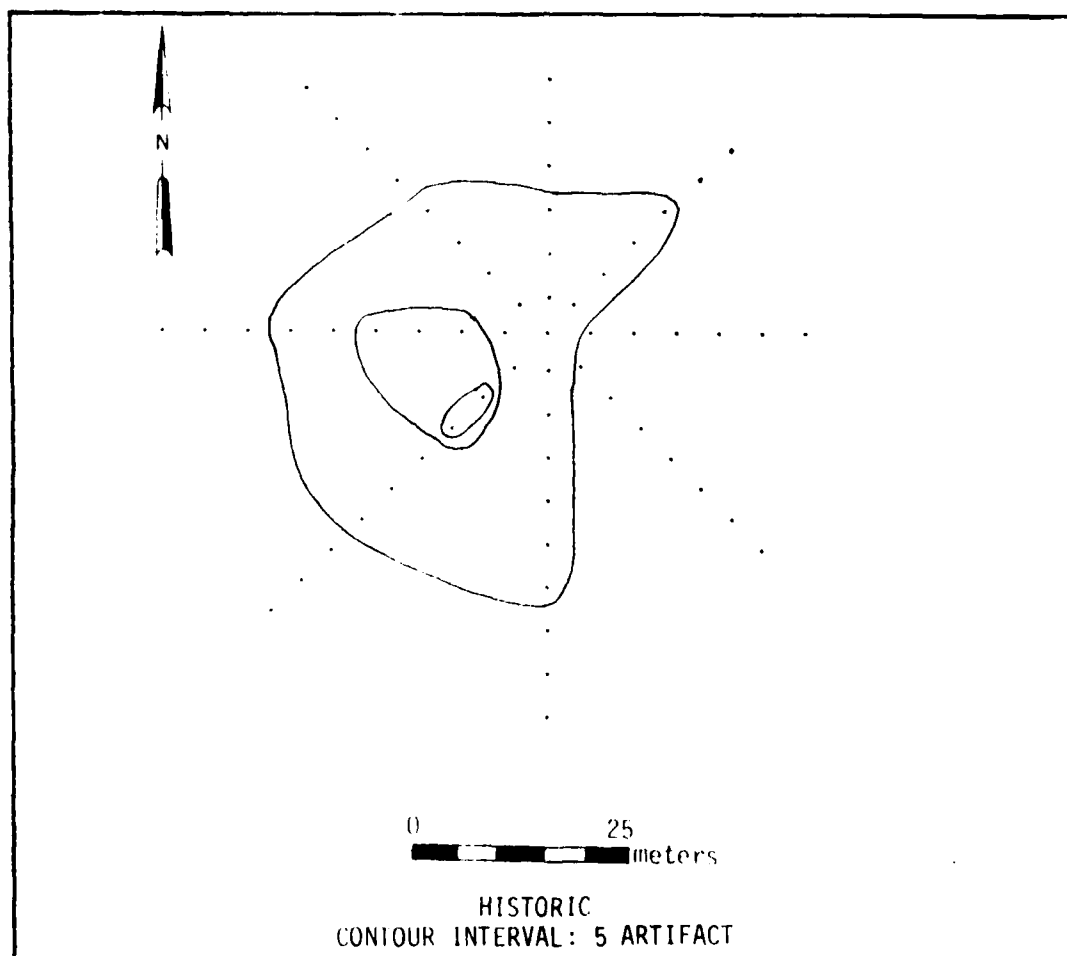


FIGURE 56. FREQUENCY CONTOUR MAP OF SITE 1Ma213 SHOWING RADIAL TRANSECT GRID.

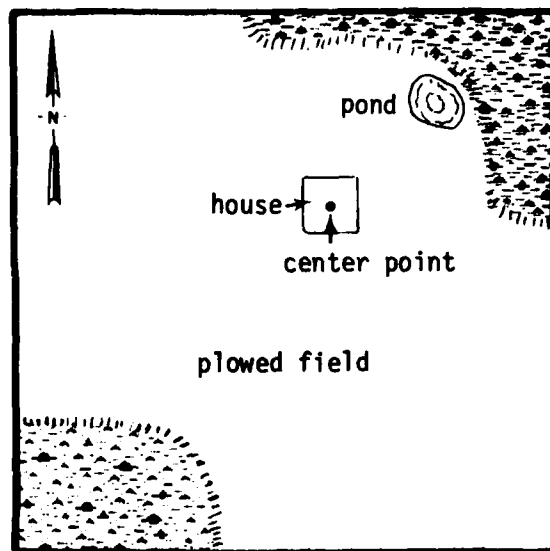


FIGURE 57. SKETCH MAP OF SITE 1Ma213



PLATE 42. 1Ma213 FRONT PORCH AND ENTRANCE TO STRUCTURE.
HIGH CONCENTRATION OF REFUSE WAS LOCATED TO
THE REAR OF THE STRUCTURE.

The house proper is oriented with the entrance and enclosed screen porch facing to the east. The majority of artifactual material (Table 20) was recovered in the rear and to the north and south of the house, with the high count in any collection square, 15, occurring off the southwestern corner of the structure. The majority of the artifacts were glass fragments, including portions of milkglass jar lid sealers, ceramics and brick fragments (Plate 41). In the interior of the house, a doorless freezer/refrigerator was located which would appear to indicate an occupation date of the mid-twentieth century to the present. The milkglass jar lid sealers are, however, most commonly used in the latter portion of the 19th century and continuing up to and through the World War II period, so that either more than one or a long continuous occupation may be indicated.

TABLE 20. ARTIFACTS RECOVERED FROM 1Ma213.

	Total Surface, Radials, & S. P.
HISTORIC	
Glass	
Medicine bottle, post-1920	
Blue	1
Soft drink	1
Unid. bottles	
Clear	27
Brown	2
Opaque (milk)	3
Milkglass jar lid sealers	3
Pane glass	2
Ceramics	
Ironstone	
Undec.	22
Blue	1
Leg of ceramic figurine	1
Metal	
Brass	
Shotgun shell	1
Miscellaneous	
Brick fragment	1
Total	65

1Ma214: Archaeological Investigations

The site was defined during the survey of the sample unit, and is situated on the southwestern, or downslope, side of the rise crest (Figure 58).

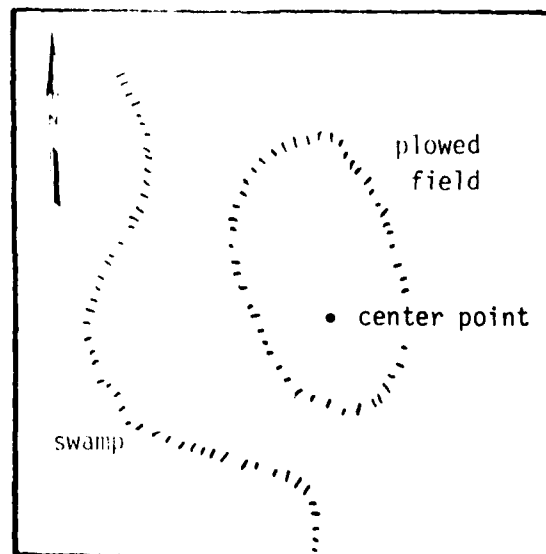


FIGURE 58. SKETCH MAP OF SITE 1Ma214.

Current Work: During the general surface reconnaissance, it was apparent that the site had two components, both historic and prehistoric, and that both were only minimally represented (Figure 59). The general reconnaissance encompassed the upslope portion of the crest, also, but failed to identify any major concentration of material in that area. As the location of the site is within a plowed field, it is possible that at least minimal artifact disturbance has occurred; however, the site, as defined, appears to be the focus of both occupations.

Current Results: All the historic material was confined to the northwest radial and quadrant of the area, and represented a total of four historic glass and ceramic pieces. The major concentration of prehistoric artifacts occurred south and east of the centerpoint, though three artifacts were also identified along the northwest radial. With the exception of one scraper, the prehistoric assemblage was characterized by secondary and tertiary flakes, a single core, and debris (Table 21). Statements concerning the chronological position of the prehistoric component cannot be made because of the lack of diagnostics present; however, the historic occupation is defined on the basis of two potentially diagnostic glass forms. A tool-applied neck, and an automatically-applied neck, were identified. The former most commonly dates to the latter half of the nineteenth century, while the latter gains popularity beginning at the turn of the twentieth century. The two ceramic pieces were non-diagnostic. On the basis of small collection, it would appear that the historic occupation or deposition occurred early in the twentieth century.

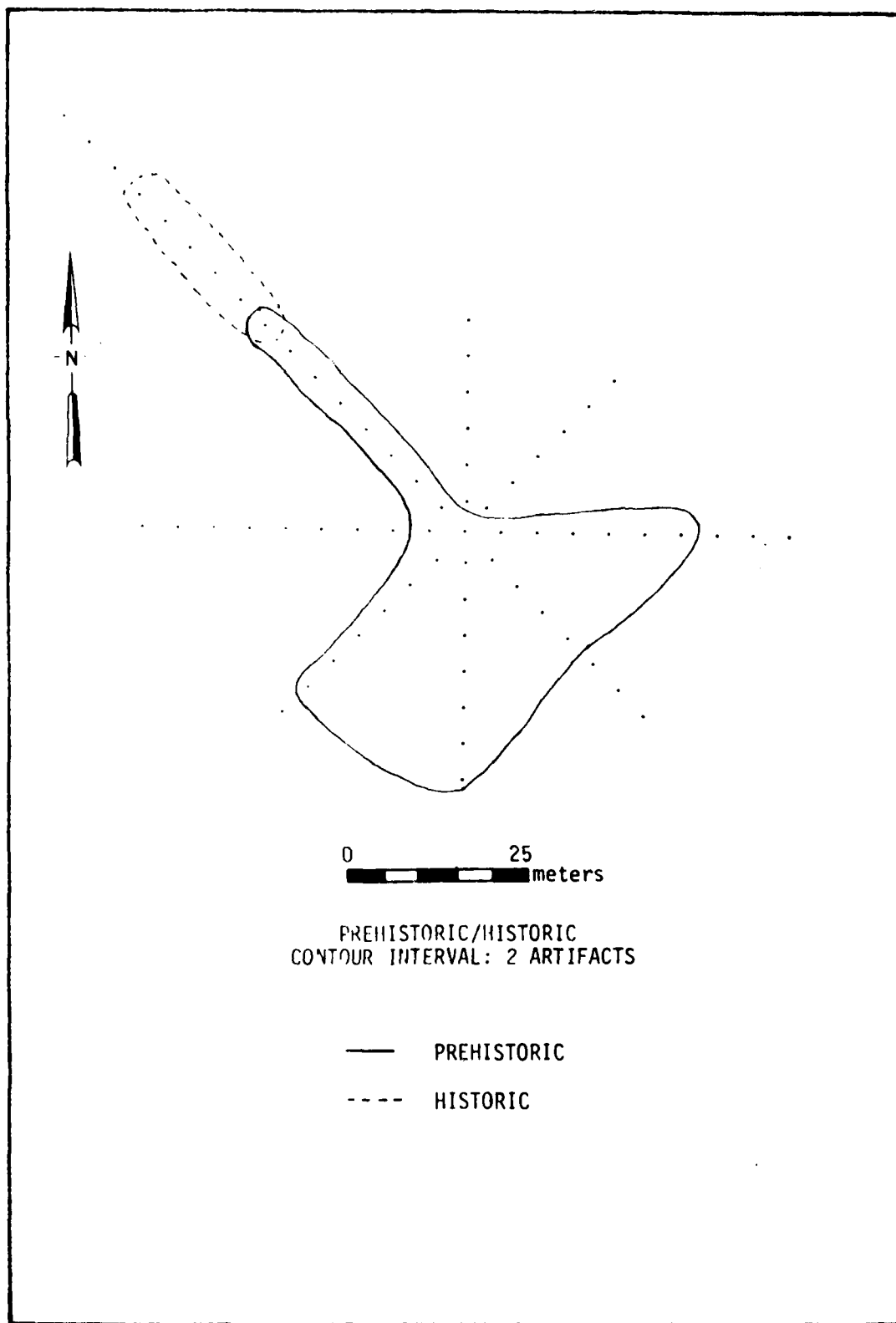


FIGURE 59 . FREQUENCY CONTOUR MAP OF SITE 1Ma214 SHOWING RADIAL
TRANSECT GRID.

TABLE 21. ARTIFACTS RECOVERED FROM 1Ma214.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flakes, unmodified	
Secondary	2
Tertiary	2
Flake frag., unmodified	
Tertiary	3
Debris, unmodified	4
Core, unmodified	1
Bifacial tools	
Small flat ovate	1
Groundstone	
Unmod. river cobble	1
Total	14
HISTORIC	
Glass	
Unid. bottles	
Clear	1
Brown	1
Ceramics	
Ironstone	
Undec.	1
Blue/grey (mod. design)	1
Total	4

1Ma215: Archaeological Investigations

The site, as noted previously, is located just to the north of the major paved access road to the northern portion of the study corridor. Composed of a standing, cinder-block structure (Plates 43 and 44), an outlying, now-collapsed shed, and a garbage dump, the site is adjacent to a currently used farm road (Figure 60). Somewhat surprisingly, none of the structures are indicated on the Huntsville 7.5' USGS quadrangle sheet (1975), which might indicate a post-1975 construction date, at least for the cinder-block structure.

Current Work: As indicated from the radials (Figure 61), the associated artifactual material was restricted to the area immediately to the east, north, and northwest of the cinder-block building. All artifacts recovered were non-diagnostic historic (Table 22). The assemblage was composed primarily of clear glass fragments, the



PLATE 43. 1Ma215 VIEW OF THE FRONT ENTRANCEWAYS.



PLATE 44. 1Ma215 INTERIOR VIEW. NOTE THE SLUMP BRICK CONSTRUCTION.

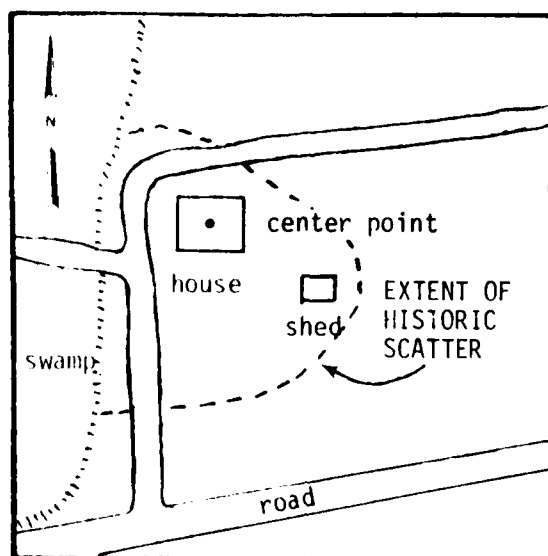


FIGURE 60. SKETCH MAP OF SITE 1Ma215.

TABLE 22. ARTIFACTS RECOVERED FROM 1Ma215.

	Total Surface, Radials, & S. P.
HISTORIC	
Glass	
Modern wine bottle	1
Unid. bottles	
Clear	4
Pane glass	1
Ceramics	
Whiteware	
Undec.	1
Ironstone	
Undec.	3
Green shell-edge	1
Miscellaneous	
Plastic container frag.	4
Total	15

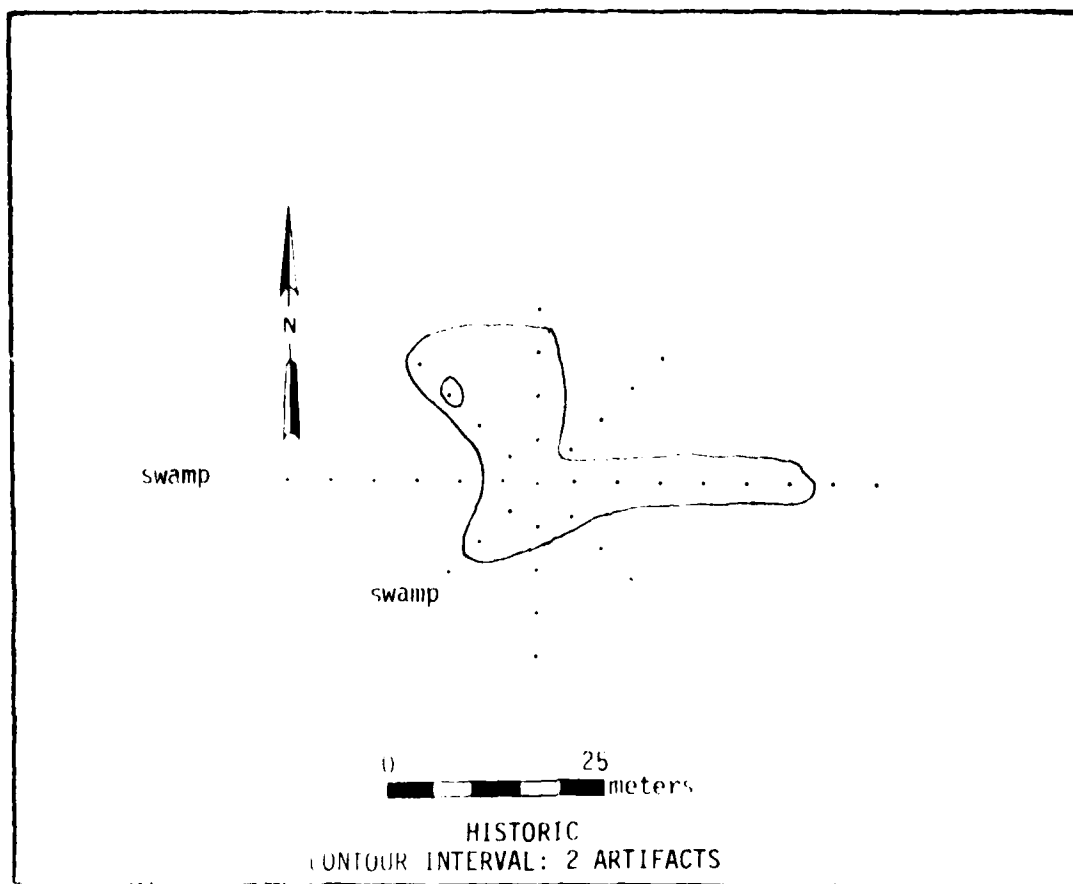


FIGURE 61. FREQUENCY CONTOUR MAP OF SITE 1Ma215 SHOWING RADIAL TRANSECT GRID.

portion of a wine bottle, plastic container fragments, and miscellaneous ironstone and whiteware fragments (Plate 41). One piece of green, shell-edged ironstone which was recovered is typical of types generally classed as "Woolworth" or retail wares (Campbell 1980).

Current Results: The proximity of the site to the main road, and the type of construction utilized for the primary structure, could possibly indicate that the main structure did not serve as a dwelling, but rather as a commercial building. Cinder-block construction is most common during the years immediately following World War II, when it was used both for low-cost housing and for building construction. Although it maintained its popularity as a construction material for structures such as bars and small mercantile/food emporia, other prefabrication materials perfected during the late 1950s and 1960s have replaced its use as housing material. The use and time of construction and occupation, however, remain problematic.

1Ma212: Introduction and Topography

The site is situated in what may be considered "typical" Huntsville Spring Branch Basin terrain, on a low rise, formed on material weathered in situ from limestone bedrock, surrounded by flat, wet land, less than one meter below the crest of this bottomland knoll. The natural mound containing 1Ma212 is elongated northwest-southeast, and measures 350 meters by 120 meters (1,148 by 394 feet) (Figure 62).

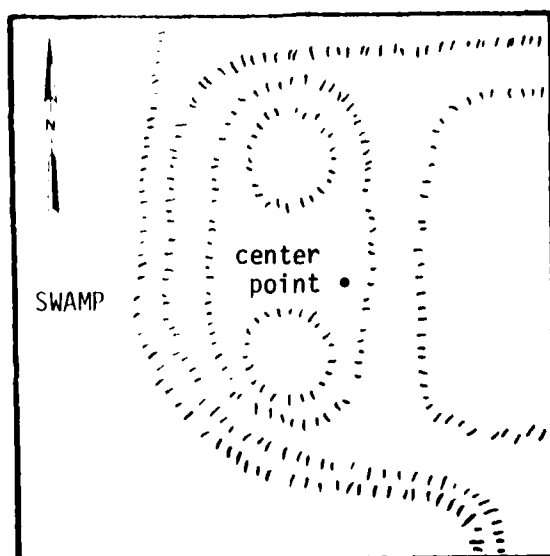


FIGURE 62. SKETCH MAP OF SITE 1Ma212.

There is no geomorphic or pedologic evidence to support the conclusion that the Huntsville Spring Branch channel would have migrated, even to within 100 meters (328 feet) of the rise. Although seeps may be present at the northwest end of the rise, there is no definite evidence for this. Lithic materials could have been obtained from the branch, which is never more than 0.5 kilometers (0.3 miles) to the west, or by crossing swamp or marshland to the rise, 300 meters (984 feet) to the northeast, upon which 1Ma211 and 1Ma214 are located. Additional lithic materials could have been obtained from outcrops in the ridge north of the Huntsville Spring Branch basin.

1Ma212: Archaeological Investigations

Current Work: 1Ma212 was originally recorded during the project survey of selected portions of the study corridor. At the time of the original survey, site size was determined to be 130 meters (426 feet)

east-west, and 120 meters (394 feet) north-south. The site was classified as a moderate-to-heavy lithic and ground stone scatter; however, no collections were made during the original survey of the location, and a general cultural affiliation could not be assigned.

The location of the site, on a bottomland knoll within the Huntsville Spring Branch Basin, and relatively high artifact frequencies reported following the initial survey of the site, led to the decision to test the site as one of the judgmental locations. After a general surface reconnaissance an arbitrary centerpoint was selected, and a radial program instituted. The radials (Figure 63) indicated that the site was 115 meters (377 feet) north-south, and 130 meters (426 feet) east-west (long axis). As defined, the majority of the artifactual material lies to the east of the centerpoint, slightly downslope from two gentle rises (Figure 62).

Both the surface reconnaissance and the radial program indicated a generally uniform artifactual density across the site area; however, six concentrations of collection squares, with more than five artifacts each, were defined within the boundaries of the site. Four of these are located to the northwest, southwest, and south/southeast of the centerpoint, in proximity to both gentle rises. Presumably, these concentrations represent the primary core of the site. The evaluation of the radial results led to the placement of the two test pits on the gentle rises.

Current Results: Test Pit 1 was excavated to a maximum depth of 30 centimeters (11.9 inches), though only one-half of the third arbitrary level was excavated. Two distinct strata were defined, with the first being a brown (7.5YR 5/4) silty clay loam plowzone. While the upper ten centimeters (3.94 inches) of the stratum yielded little in the way of artifactual material, the lower portion produced 19 assorted flakes. The underlying Stratum 2 has been disturbed in its upper levels by plow action; however, with the exception of two tertiary flakes, it is sterile of artifactual material. This stratum is a dark brown (5YR 5/8) silty clay loam.

Test Pit 2 was situated to the north of Test Pit 1, on a slightly higher gentle rise, which may account for the color differentiation in the units' two strata. Dug in three arbitrary levels to 30 centimeters (11.9 inches), this pit revealed two strata. Stratum 1 is virtually identical to that in Test Pit 1, although it differs slightly in color being reddish-brown (5YR 4/3). Stratum 2 is a sterile reddish (2.5YR 4/6) sandy clay loam. All artifactual material was recovered from Stratum 1.

Because of the differentiation in profiles, a more intensive subsurface testing procedure was implemented to determine if the color differences were indicative of the presence of midden or features. Three 15 meter (49 feet) interval auger lines were run north-south beginning 7.5 meters (24.6 feet) south of the east-west line. The auger holes were placed at five meter (16.4 feet) intervals along each line, but no subsurface deposits were located.

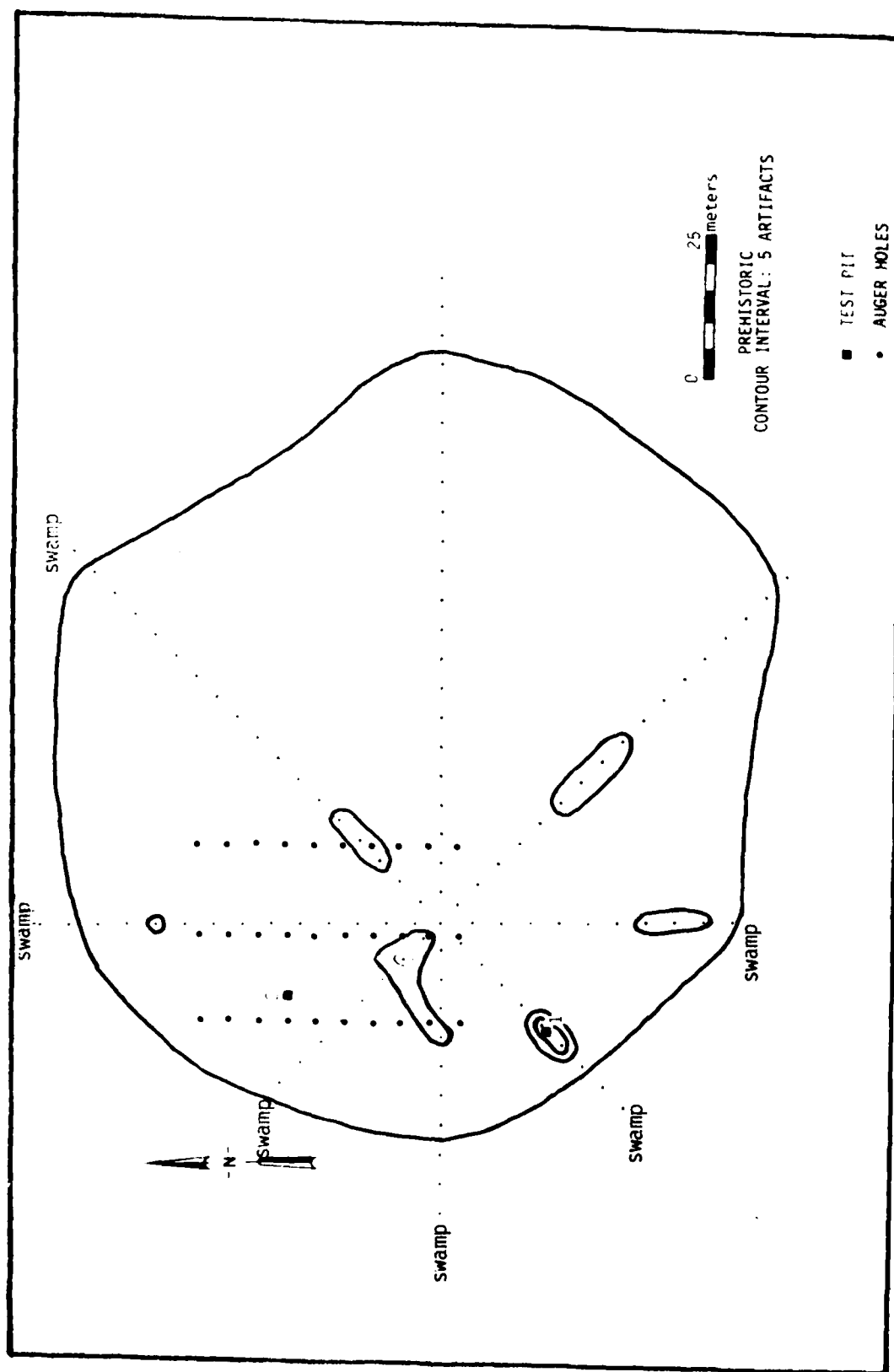


FIGURE 63. FREQUENCY CONTOUR MAP OF SITE 1Ma212 SHOWING RADIAL TRANSECT GRID, TEST PITS AND AUGER HOLES.

This site represents a moderate-sized artifact scatter that has obviously been disturbed by agricultural activities. Two diagnostic projectile points were recovered (Table 23) which indicated a Late Archaic occupation for the site (Plate 45).

1Ma220, 1Ma230, and 1Ma221: Introduction and Topography

Both 1Ma220 and 1Ma230 lie on a low rise formed on material weathered from Tuscomb limestone bedrock (Figures 64, 65 and 66). 1Ma221, an historic garage (Plate 46), is situated in a similar setting, though the elevation of the rise is appreciably less. The elevated land occurs at the margin of the Robertsville-soil bottomland, which extends south along the western side of the slightly lower, Melvin-soil, Byrd Spring Lake basin. On the crest, the rises are less than 0.6 meters (1.97 feet) above the bottomland to the north, west, and south, and 1.5 meters (4.92 feet) above the ephemeral lake basin to the east. Gentle slopes lead from the crests down to the flat lake bottomland, which, in the case of 1Ma220, is some 100 meters (328 feet) to the east.

As is the case with several other sites on knolls in the Huntsville Spring Branch Basin, the prehistoric inhabitants of 1Ma220 and 1Ma230 had no immediate access to sources of the local chert. To reach outcrops in the limestone ridge which forms the eastern boundary of the basin, the swampy, possibly lake-filled, Byrd Spring Lake basin had to be crossed, a straight-line distance of two kilometers (1.2 miles). However, it would appear that the most feasible route would have entailed traveling north, around the western margin of the lake bottomland, passing the present locations of 1Ma183 and 1Ma182, a distance of approximately 5 kilometers (3.1 miles).

Each of the three sites was recorded during the sampling survey of selected portions of the study corridor. The majority of the sampling unit encompassed swamp or sections of Byrd Spring Lake, and, therefore, the primary survey concentrated on the elevated portions of the unit. At least three-quarters of the sample unit lie within the Byrd Spring Rod and Gun Club, and the Club has instituted a limited land management and modification program in order to enhance wildlife areas and access to those areas. Therefore, the majority of the elevated rise has been plowed and seeded in tall, blind grasses, or has been contoured in such a way as to allow for the formation of shallow-water ponds. Both the grass cover and the shallow-water ponds inhibited survey of the elevated areas, and, except in localities of roadcuts or cleared areas, a shovel-pitting program was conducted at 30-meter (98 feet) intervals along transect lines. With the exception of 1Ma221, which was a standing structure, the sites were identified in a combination shovel-pitting procedure and ground reconnaissance.

1Ma220: Archaeological Investigations

1Ma220 is one of the five sites encountered during the survey of the sampling units to be tested. Selected on the basis of its

TABLE 23. ARTIFACTS RECOVERED FROM 1Ma212.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Primary	3			3
Secondary	5	2		7
Tertiary	58	7	1	66
Flake frag., unmodified				
Primary	1			1
Secondary	10			10
Tertiary	84	13	8	105
Debris, unmodified	38	1	2	41
Flakes, modified				
Tertiary	1			1
Flake frag., modified				
Secondary	1			1
Tertiary	2			2
Debris, modified	1			1
Core			1	1
Blade	1			1
Unifacial tools				
End scraper on flake	1			1
End scraper on chunk	1			1
Denticulate flake	1			1
Notched flake	2			2
Bifacial tools				
Small flat ovate	1			1
Preform	1			1
Unid. frag., w/chopping use	5			5
Unid. frag., w/scraping use	1			1
Drill	1			1
Punch/graver	2			2
Spokeshave/graver	1			1
Scrapers	2			2
Projectile points				
Edgewood	1			1
Sublet Ferry	1			1
Unid. proj. pts., whole and fragmentary	5			5
Groundstone				
Battered pebble/small cobble fragment	1			1
Battered large cobble fragment	6			6
Battered pitted cobble	2			2
Atlatl weight	1			1
Mortar	1			1
Celt	1			1
Total	243	23	12	278



a



b



c



d



PLATE 45 PROJECTILE POINTS FROM 1Ma212 and 1Ma220.
1Ma212: a, Edgewood; b, Sublet Ferry; c, Drill fragment.
1Ma220: d, Morhiss variant.

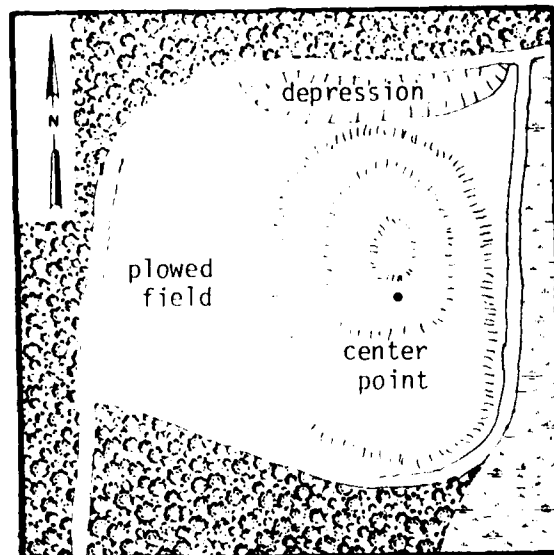


FIGURE 64. SKETCH MAP OF SITE 1Ma220.

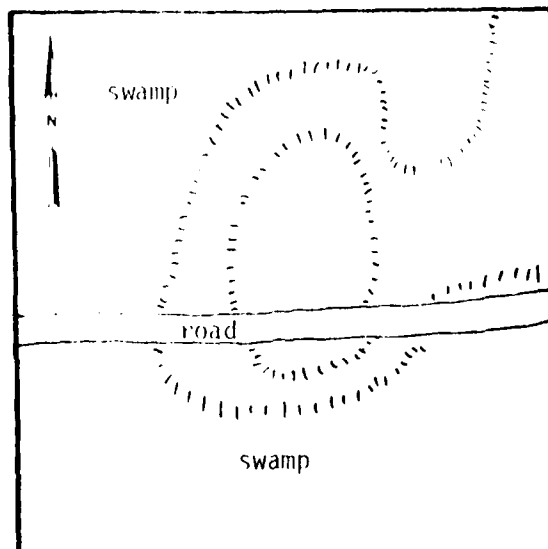


FIGURE 65. SKETCH MAP OF SITE 1Ma230.

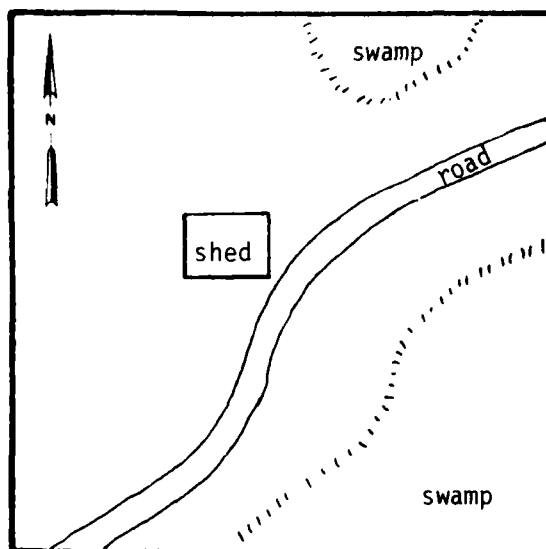


FIGURE 66. SKETCH MAP OF SITE 1Ma221.



PLATE 46. 1Ma221 STANDING GARAGE LOCATED WITHIN THE BYRD SPRING ROD AND GUN CLUB.

topographic setting and association with the Byrd Spring Lake area, the site was tested, despite impact to its northern border by a borrow pit.

Current Work: As defined during the survey, 1Ma220 was designated a light-to-moderate lithic scatter, with ground stone. According to a local informant, the Gun Club caretaker, Mr. W. Turner, the site area had initially been plowed some fifteen years earlier, and was usually plowed again about every four years. A large borrow pit intrudes into the northern margin of the site; the materials from the pit are used to maintain the access road through the area. No diagnostic artifacts were recovered during the initial survey.

The initial surface reconnaissance performed during the survey and recording of the site served as the basis for the placement of the arbitrary centerpoint. As the site is located on a rise crest, the centerpoint was situated slightly south, and downslope, from the point of maximum elevation, in order to cover not only the rise, but also the lower elevations. As illustrated on Figure 67, surface artifact densities were miniscule, with all of the artifactual material confined to the rise area. Although the radial data were scanty, on the bases of what data were present and on the subsequent results of the test pit procedure, it appears that the primary core area of the site is confined to the rise crest, and slightly downslope to the south, with peripheral occurrences of artifacts present further downslope. Site size, on the basis of the evaluation, would be approximately 30 meters (98 feet) north-south, and approximately 18 meters (59 feet) east-west.

The low surface densities necessitated the placement of the test pits in judgmentally determined areas. Both units were placed in the vicinity of the rise crest, in order to determine the presence of sub-surface features or midden.

Current Results: Test Pit 1 was excavated in two arbitrary levels, to a depth of 20 centimeters (7.9 inches) below the present ground surface. Two separate strata were defined in the unit. Stratum 1 is a dark-red (2.5YR 3/6) silty clay loam, which has been disturbed by plowing. All artifactual material, which consisted primarily of flakes and flaking debitage, came from Stratum 1. The sub-plowzone Stratum 2, a dark reddish-brown (2.5YR 3/4) silty clay loam, was sterile of artifactual material.

Test Pit 2 was also excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface. The identical profile revealed in Test Pit 1 was present. The base of a Morhiss-variant was recovered from Stratum 1, with the remainder of materials being flakes or flaking debitage. Stratum 2 was sterile of cultural deposits.

This site produced very low artifact frequencies (Table 24), and, as noted above, only a single diagnostic indicating a date of

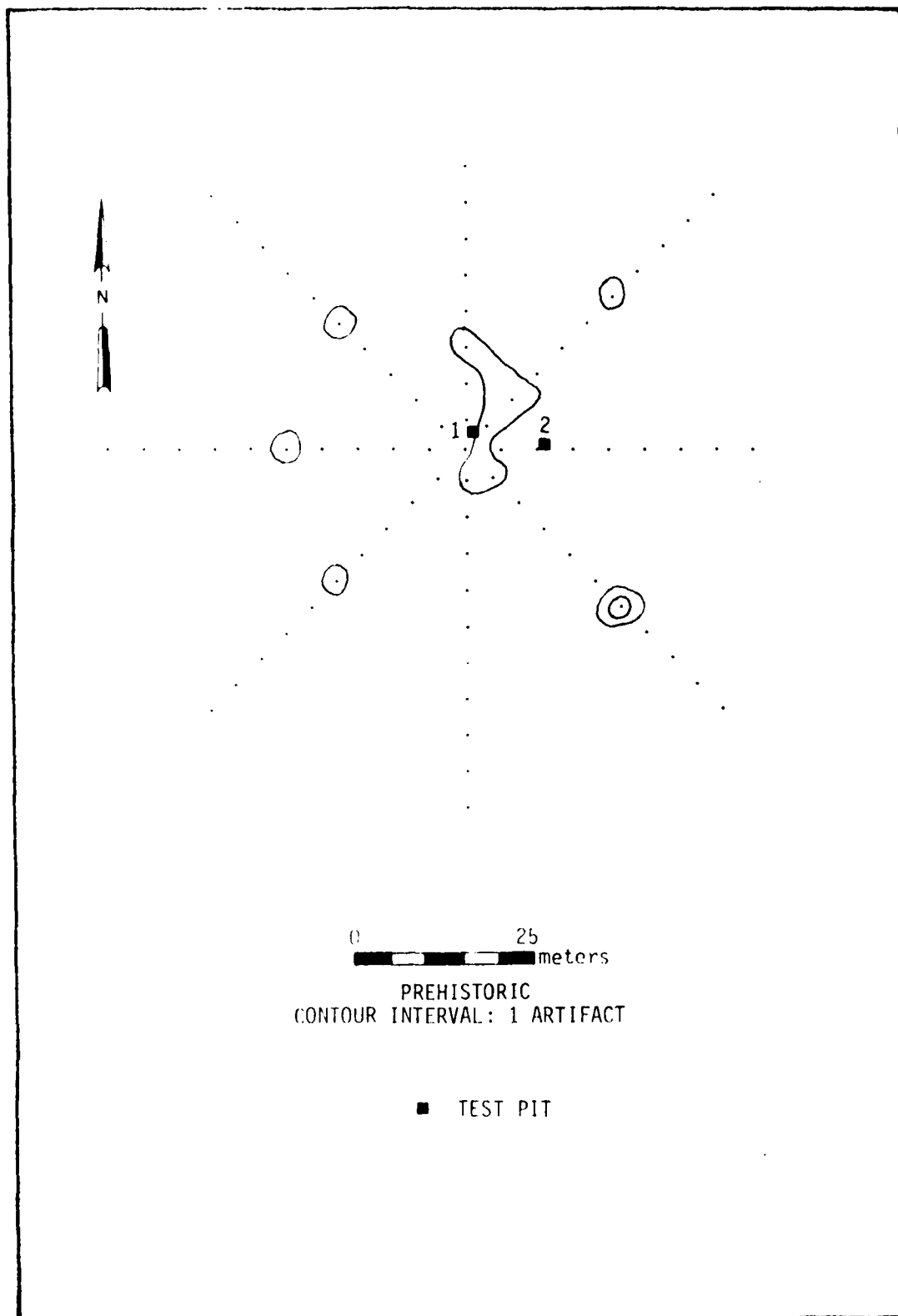


FIGURE 67 . FREQUENCY CONTOUR MAP OF SITE 1Ma220 SHOWING RADIAL
TRANSECT GRID AND TEST PITS.

occupation during the Late Archaic period (Plate 45). The absence of substantial artifactual material and deposits precludes any further interpretations of the site.

TABLE 24. ARTIFACTS RECOVERED FROM 1Ma220.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Tertiary		5		5
Flake frag., unmodified				
Primary		1		1
Tertiary	3	8	3	14
Debris, unmodified	6	4	2	12
Flakes, modified				
Secondary	1			1
Projectile points				
Morhiss var.			1	1
Total	10	18	6	34
HISTORIC				
Glass				
Unid. bottles				
Clear	1	1		2
Total	1	1		2

1Ma230: Archaeological Investigations

1Ma230 is situated 85 meters (278 feet) east of 1Ma220, and is separated from the latter by a low, permanent swamp/stream of the larger Byrd Spring Lake. The site encompasses a rise crest, as was the case with 1Ma220, which has been plowed. At the time of survey, the rise crest was lightly covered in grass.

Current Work: The site setting, on a low rise within the Byrd Spring Lake area, made it a high probability location for the occurrence of cultural resources. However, during the initial survey of the survey unit, no indications of cultural materials were identified, despite good ground visibility. A re-examination of the site area during the course of the fieldwork on 1Ma220 identified the presence of two flakes, which failed to meet the minimum criteria for a site classification. Heavy rains halted work on 1Ma220, and, upon the return to the site, another reconnaissance of the 1Ma230 area was made. At that time, more than three flakes, but fewer than ten

artifacts were noted on the surface. Time limitations did not allow for the implementation of a formal radial procedure at the site; however, the presence of more than three artifacts in the location led to the decision to record the location as a site.

Current Results: No diagnostics were identified during the three reconnaissances of the site area; therefore, a general cultural affiliation cannot be assigned.

1Ma221: Archaeological Investigations

1Ma221 is located on the principal east-west-trending road through the Byrd Spring Rod and Gun Club. The site is an historic garage (Plate 46, Figure 66).

Current Work: Although the area of the garage was covered during a general surface reconnaissance, no artifactual material was identified; therefore, the decision was made to conduct no formalized radial procedure at the site. In lieu of the boundary definition program, the building was photographed (Plate 46), and notes taken on the construction. The building is a wooden frame structure, which, from informant information, was used as a garage prior to the acquisition of the land by the Byrd Spring Rod and Gun Club. The garage measures approximately four meters (13.1 feet) square, and is approximately three meters in height (9.8 feet). There has been internal finishing of walls.

Current Results: The site lies adjacent to the old rural mail route (Kirkpatrick 1934), and may, possibly, date to the pre-World War II period. Since the inception of the Byrd Spring Road and Gun Club, the garage has been used as a storage shed.

1Ma223, 1Ma224, 1Ma225, 1Ma227, and 1Ma228: Introduction and Topography

All of the sites are on a single, irregularly elongated, rise in the Huntsville Spring Branch Basin, along the eastern portion of the southern margin of the Byrd Spring Lake bottomland. A ten percent slope extends from the descending ridge crest down to the lake basin floor, two meters in elevation below the crest. The rise is 10 to 400 meters (32 to 1,312 feet) wide. It is bounded on the southwest by a swampy swale, which now contains an artificially channeled stream that flows south, and eventually joins the Boundary Canal. This channel appears to have been cut artificially through a low saddle, which joined the rise to another, irregular, rise to the southwest. In this portion of the basin, the boggy, bottomland areas make up approximately fifty percent of the land, and the rises comprise the other fifty percent.

Sites 1Ma224, 1Ma225, and 1Ma228 (Figures 68, 69, and 70, and Plate 47)(an historic farm complex), are in the central, narrowest portion of the rise, each on a low knoll less than 100 meters (328

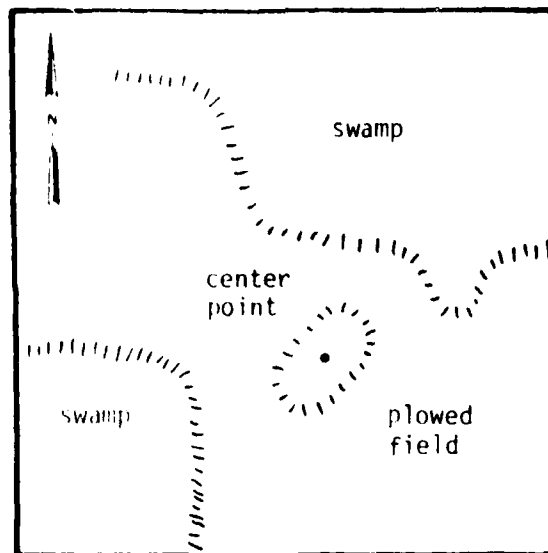


FIGURE 68. SKETCH MAP OF SITE 1Ma224.

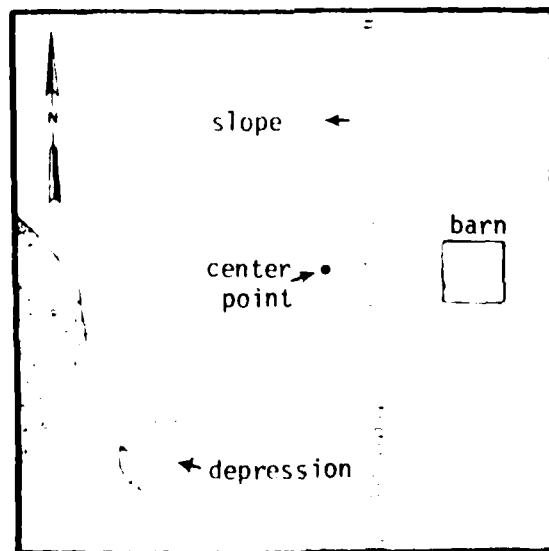


FIGURE 69. SKETCH MAP OF SITE 1Ma225.

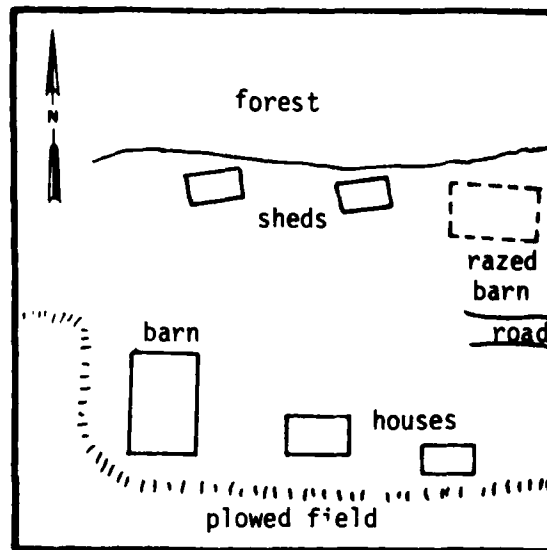


FIGURE 70. SKETCH MAP OF SITE 1Ma228.



PLATE 47. 1Ma228 STANDING BARN, ONE OF TWO BARNS PRESENT IN THE STRUCTURE COMPLEX WHICH ALSO INCLUDED TWO HOUSES AND TWO EQUIPMENT SHEDS.

feet) from the lake basin, and some three meters (9.8 feet) in elevation above it. Site 1Ma223 is on the north-western end of the rise, also on a low knoll (Figure 71), but closer to the nearly closed swale to the southwest than it is to the lake bottomland margin (50 meters versus 200 meters: 164 feet versus 656 feet). The only surface exits for the water from this swale are the artificial channel noted above, cut across the higher ground of the inter-rise saddle, and a narrow, natural outlet to the Byrd Spring Lake bottomland. This swale could have contained standing water during prehistoric times. 1Ma227 (Figure 72) a prehistoric site, is the farthest on this rise from the lake basin margin (which lies some 240 meters or 787 feet to the north).

Local sources of chert nodules for utilization at the prehistoric sites could have been found in the ridge which forms the eastern margin of the Byrd Spring Lake bottomland, a minimum of two kilometers (1.2 miles) to the northeast. Other nearby potential sources of chert are Weatherly and Mathis Mountains, approximately three to four kilometers (1.8 to 2.5 miles) to the east and southeast.

1Ma223: Archaeological Investigations

Current Work: The site was originally discovered during the sampling survey of selected portions of the study corridor. At the time of the initial recording, the site was identified as a moderate-to-heavy lithic and ground stone scatter within a plowed field.

Following a general reconnaissance of the site vicinity, an arbitrary centerpoint was selected on the rise crest. The reconnaissance had indicated that material density was generally uniform across the site area; therefore, placement of the centerpoint did not consider factors of topography or possible downslope movement of artifactual material. The radial contour determination, however, pointed to a concentration of material on the rise proper, with decreasing frequencies downslope, or away, from the centerpoint (Figure 73). On the basis of the radials, size was estimated to be 65 meters (213 feet) north-south, and 65 meters (213 feet) east-west. The highest concentration of cultural material in any collection square was seven occurring on the north transect line, five meters (16 feet) from the centerpoint. It would appear from the artifact densities (Figure 73) that the primary core area of the site is only slightly smaller than the total site area.

Current Results: A total of 106 artifacts was recovered during the radial collection program, including five diagnostic projectile points (Table 25). The five points are indicative of a time-spread from Paleo-Indian through Late Woodland, with the overlap between the types indicating a fairly strong occupation in the Late Archaic/Early Woodland (Morriss-variant, Type 97 (Faulkner and McCollough 1973), Copena Triangular) (Plate 48). The possible Paleo-Indian occupation is represented by one Milnesand variant, while the Late Woodland occupation is possibly represented by the Hamilton, and, if using its

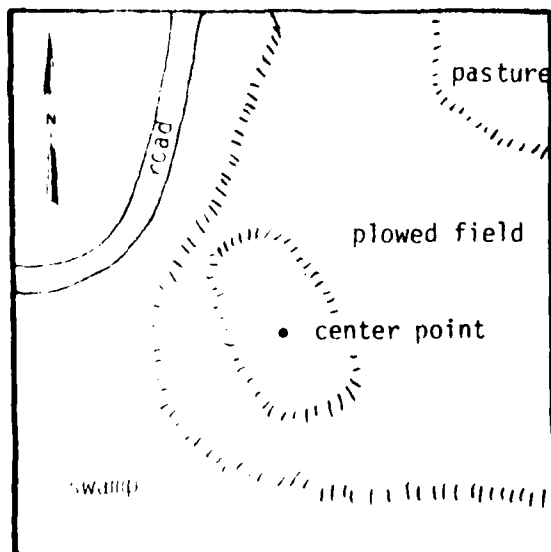


FIGURE 71. SKETCH MAP OF SITE 1Ma223.

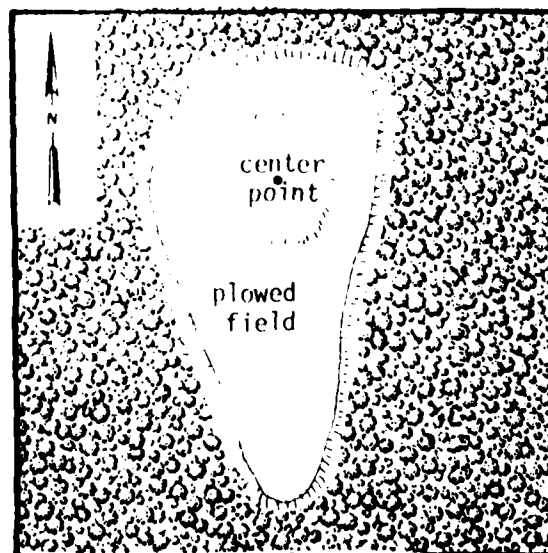


FIGURE 72. SKETCH MAP OF SITE 1Ma227.

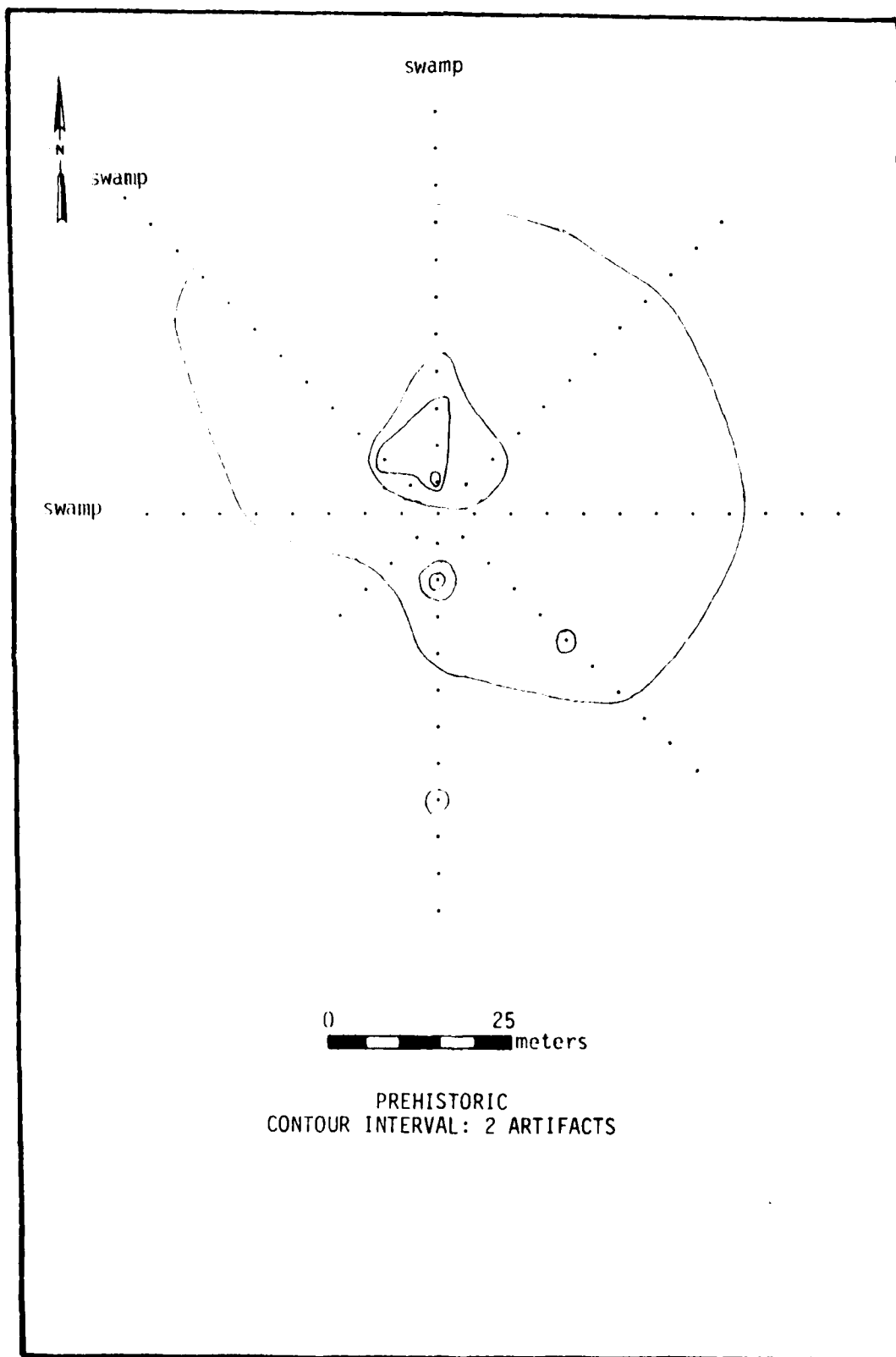


FIGURE 73. FREQUENCY CONTOUR MAP OF SITE 1Ma223 SHOWING RADIAL
TRANSECT GRID.



a



b



c



d



e



PLATE 48. PROJECTILE POINTS AND STEATITE VESSEL SHERDS FROM
1Ma223.
a, Copena Triangular; b, Morhiss variant; c, Type 97;
d, Hamilton; e, Steatite Vessel fragment.

TABLE 25. ARTIFACTS RECOVERED FROM 1Ma223.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Primary form	1
Flakes, unmodified	
Primary	5
Secondary	6
Tertiary	21
Flake frag., unmodified	
Tertiary	38
Debris, unmodified	18
Core, unmodified	3
Unifacial tools	
Transverse scraper	1
Side scraper	1
Spokeshave	1
Bifacial tools	
Unid. frag. w/scraping use	1
Unid. frag., no apparent usage	1
Backside scraper	1
Projectile points	
Knife/proj. pt. frag.	1
Milnesand var.	1
Copena Triangular	1
Type 97 - Faulkner & McCollough 1973	1
Morhiss var.	1
Hamilton	1
Groundstone	
Steatite vessel fragment	1
Total	105
BONE	
Unid. fragment	1
Total	1

latest occurrence, the single Copena Triangular. The occurrence of a single steatite vessel fragment would tend to reinforce the idea of a Late Archaic/Early Woodland occupation, however. The remainder of the assemblage includes a full range of flake and tool preparation stages, though biface preforms are lacking. Nonetheless, from the elements within the assemblage, it would appear that a fuller range of activities was conducted at the site than would be expected at a specialized or limited-activity location.

1Ma224: Archaeological Investigations

Current Work: The site was initially recorded during the sampling survey of selected portions of the study corridor. Situated approximately 150 meters (492 feet) southeast of 1Ma223, it is separated from that site by a well-defined rise swale. The site occupies a rise crest, and a close examination of the rise swale to the northwest between 1Ma224 and 1Ma223 revealed no artifactual material. As the entire area is currently a plowed field, it would be expected, if the sites were component parts of a larger cultural manifestation, that material would have been present in the lower-lying areas of the field. Following the areal reconnaissance, the centerpoint for the radials was situated on the center of the small rise.

Current Results: As can be seen from Figure 74, artifact densities were quite low, despite two collection squares which yielded four artifacts apiece. On the basis of the radial program, the area of the site was determined to be some 900 square meters (2,925 square yards). No diagnostics were recovered during the survey of the site, nor during a subsequent revisit to the site area. A total of fourteen flakes was recovered (Table 26), which included one primary flake, tertiary and tertiary flake fragments, a modified tertiary flake, and debris. It is virtually impossible to interpret the possible function of the site from such an assemblage, and to categorize it on the basis of a small artifact assemblage as a limited-activity or specialized-activity area would be fallacious.

TABLE 26. ARTIFACTS RECOVERED FROM 1Ma224.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flakes, unmodified	
Primary	1
Tertiary	5
Flake frag., unmodified	
Tertiary	4
Debris, unmodified	3
Flakes, modified	
Tertiary	1
Total	14

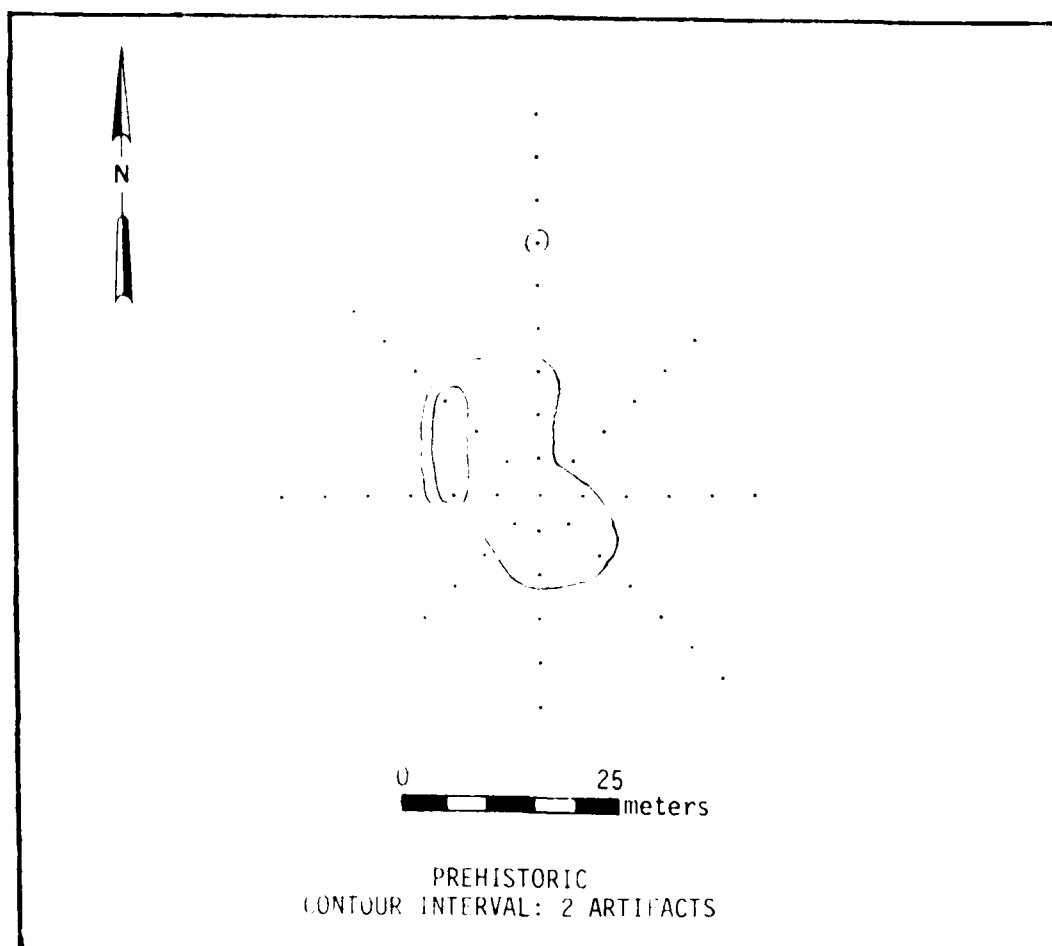


FIGURE 14. FREQUENCY CONTOUR MAP OF SITE 1Ma224 SHOWING RADIAL
TRANSECT GRID.

1Ma225: Archaeological Investigations

Current Work: 1Ma225 is situated on a slight rise in a plowed field, directly west and downslope from 1Ma228, an historic farm complex. At the time of survey, the field, though not recently plowed, was devoid of ground cover, and visibility was good. The general area of the site was carefully scrutinized prior to the initiation of the radial program, in order to determine if the pre-historic materials continued upslope to the east into the area of the farm complex. There appeared to be no continuation of material into the 1Ma228 area, and the position of the majority of artifacts on a slight rise within the lower slope field does, somewhat, preclude the possibility that the material was deposited in downslope wash. The arbitrary centerpoint was situated slightly to the east of the rise centerpoint.

Current Results: As with 1Ma225, surface artifact densities were generally low, with the high count occurrence in any given collection square being three, along the south radial. On the basis of the radial program, the site area was determined to be approximately 50 meters by 50 meters square (164 feet square) (Figure 75). The proximity of the site to the historic farm complex, and the possibility of collection of the site by the inhabitants of 1Ma228 cannot be overlooked in the evaluation of the site.

Two diagnostic projectile points, a Big Sandy and a Type 87 (Faulkner and McCollough 1973) were recovered during the survey of the site (Plate 49). These would indicate an Archaic occupation of the locality. The Big Sandy point is most commonly associated with the Early Archaic, however, Type 87 is indicated as having an unspecified, general Archaic occurrence. The remainder of the assemblage (Table 27) is primarily flakes and debris, though two flakes showing chopping and scraping use were identified.

1Ma227: Archaeological Investigations

As noted earlier, the site is situated farthest away from the lake basin margin, and is within a plowed field.

Current Work: The site was identified during the course of the project's sample survey of selected portions of the study corridor. At that time, following the radial evaluation, it was designated a light lithic scatter, with only slight amounts of chipped stone and ground stone. The arbitrary centerpoint was situated, following a general, non-collection surface reconnaissance, slightly south of the rise crest. The presence of bottomland woods both to the east and to the west of the rise resulted in a constricted, tear-drop shape to the rise, with the larger (wider) portion of the configuration to the north (Figure 72).

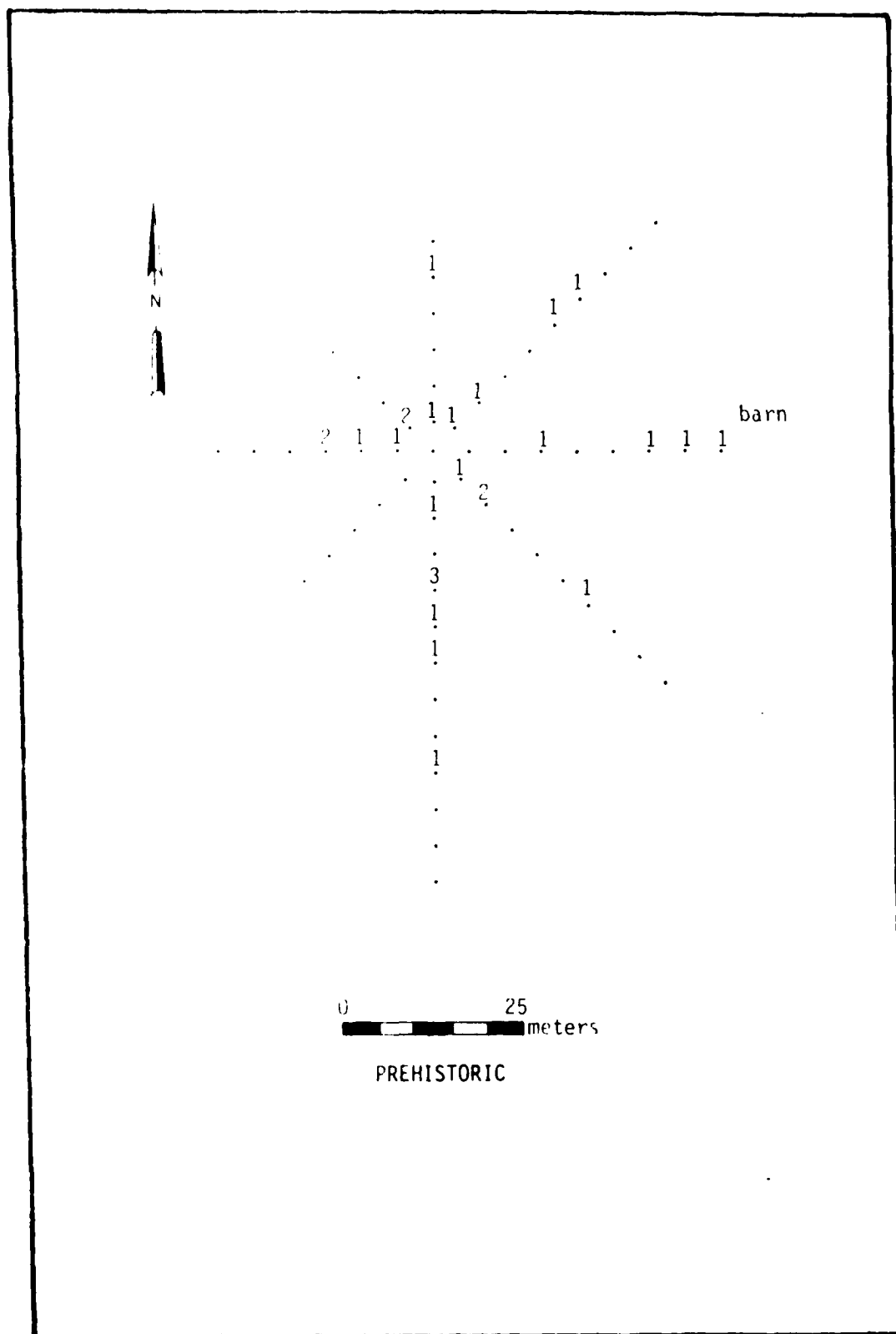


FIGURE 74. MAP OF SITE 1Ma225 SHOWING FREQUENCIES OF ARTIFACTS
RECOVERED FROM RADIAL TRANSECTS.

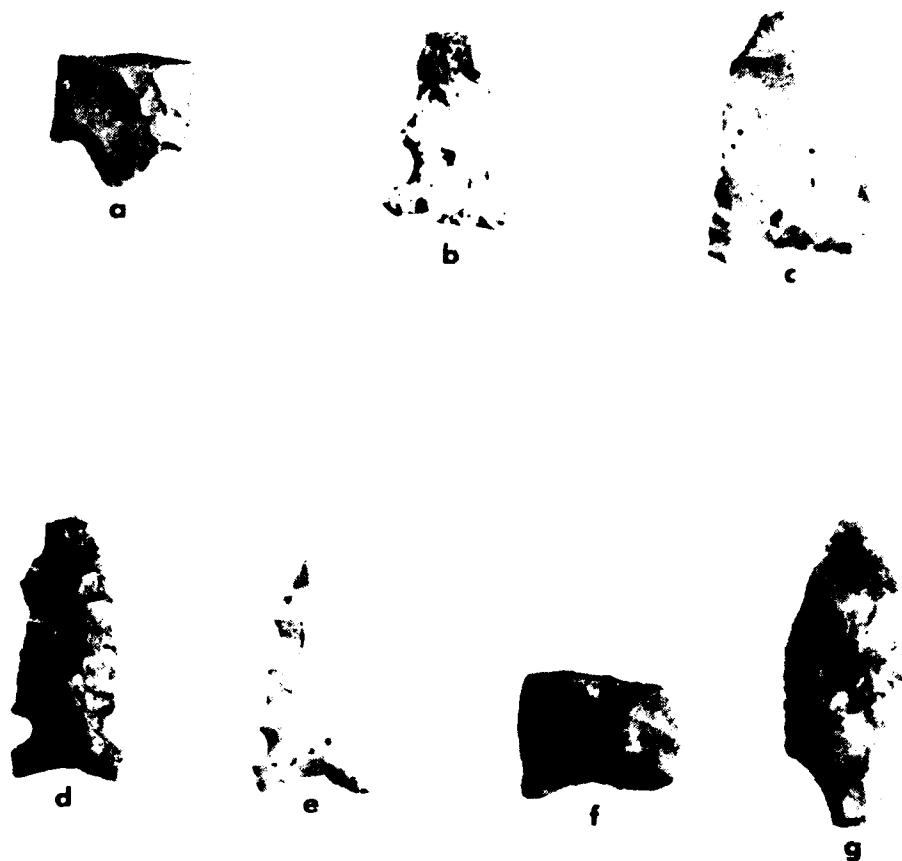


PLATE 49. PROJECTILE POINTS FROM 1Ma225, 1Ma226, 1Ma227, AND 1Ma218.

1Ma225: a, Type 87; b, Big Sandy.

1Ma226: c, Candy Creek; d and e, Big Sandy.

1Ma227: f, Candy Creek.

1Ma218: g, Mud Creek.

TABLE 27. ARTIFACTS RECOVERED FROM 1Ma225.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flakes, unmodified	
Primary	1
Secondary	2
Tertiary	5
Flake frag., unmodified	
Primary	1
Tertiary	6
Debris, unmodified	6
Bifacial tools	
Unid. frag. w/scraping use	1
Projectile points	
Big Sandy	1
Type 87 (Faulkner & McCollough 1973)	1
Unidentified	1
Total	25

Current Results: The radial program indicated that the majority of artifactual material was located to the south primarily downslope from the rise crest, toward the constricted end of the rise, with limited distribution to the north, east, and west (Figure 76). High density in any collection square was three, including one projectile point base, along the north radial. The radials indicated that the site is approximately 97.5 meters (320 feet) north-south, and 50 meters (164 feet) east-west.

Only one diagnostic was recovered during the course of the site definition: the base of a Candy Creek projectile point (Plate 49). The chronological position of that particular type is Woodland, with its initial appearance in the Early Woodland and continuing presence through the Late Woodland. The remainder of the assemblage is composed of various unmodified flakes, a transverse scraper, and a side/end scraper with graver point (Table 28). Again, the problem of site classification as to function is hazy, given the size of the assemblage. It would appear that the site is a lithic scatter, but exact function cannot be assessed at this point.

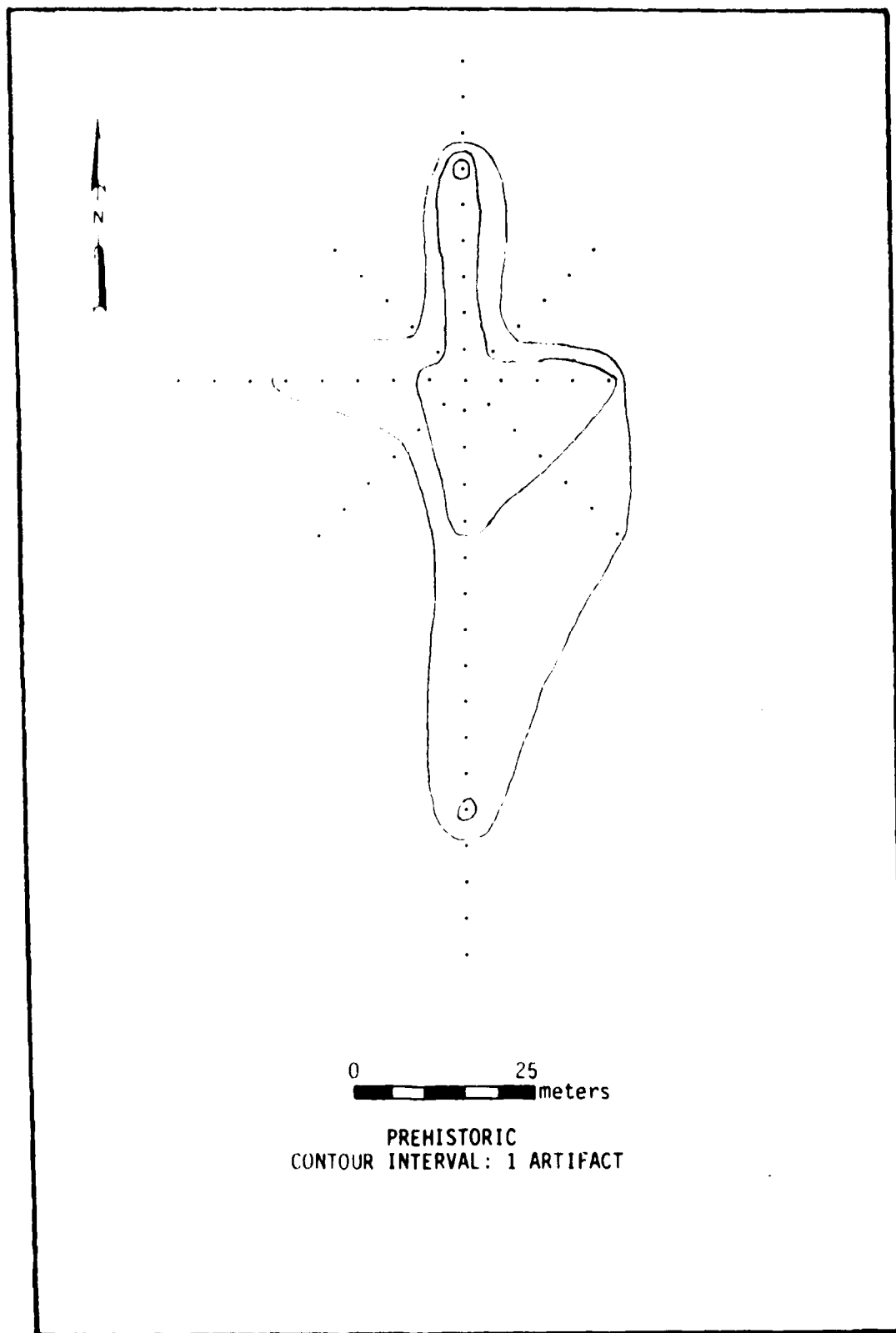


FIGURE 76. FREQUENCY CONTOUR MAP OF SITE 1Ma227 SHOWING RADIAL
TRANSECT GRID.

TABLE 28. ARTIFACTS RECOVERED FROM 1Ma227.

	Total Surface, Radials, & S. P.
<u>LITHICS</u>	
Chipped stone	
Flakes, unmodified	
Secondary	3
Tertiary	5
Flake frag., unmodified	
Secondary	1
Tertiary	13
Debris, unmodified	9
Unifacial tools	
Transverse scraper	1
Domed scraper/chopper	1
Projectile points	
Candy Creek	1
Total	34

1Ma228: Archaeological Investigations

Current Work: The site is situated on a well-defined rise immediately west of 1Ma225, and was identified during the course of the sampling survey of selected portions of the study corridor.

Current Results: Six standing structures, including two houses, two sheds, and two barns are present at the site (Plate 47). Both of the houses have indoor plumbing, which probably accounts for the lack of a well on the property, as the units were probably supported from the Huntsville water system. No artifactual collections or radials were conducted at the site; however, a sketch map of the relationship of the various buildings was made (Figure 70).

1Ma226: Introduction and Topography

The site was originally defined and recorded during the project survey of selected portions of the study corridor. It is situated on an irregular rise in the Huntsville Spring Branch bottomland (Figure 77), one kilometer (.6 miles) south of the Byrd Spring Lake bottomland. The rise crest is less than one meter in elevation above adjacent swales and depressions to the west, north, and east. It is approximately two meters (6.6 feet) in elevation above the bottom of the Boundary Canal bottomland, which borders the rise on the southwest and south.

Potable water could have been obtained from ponds in several depressions within 100 meters (328 feet) of portions of the site area,

and a small, natural stream is present in the present Boundary Canal bottomland. The stream currently moves north, then west, along the rise, eventually entering Huntsville Spring Branch. The stream channel was probably no more than 150 meters (492 feet) away from the southwestern portion of the site. Local chert sources are situated to the north in the ridge along Byrd Spring Lake, or to the east and southeast in the slopes of Weatherly and Mathis Mountains, all within a radius of three to five kilometers.

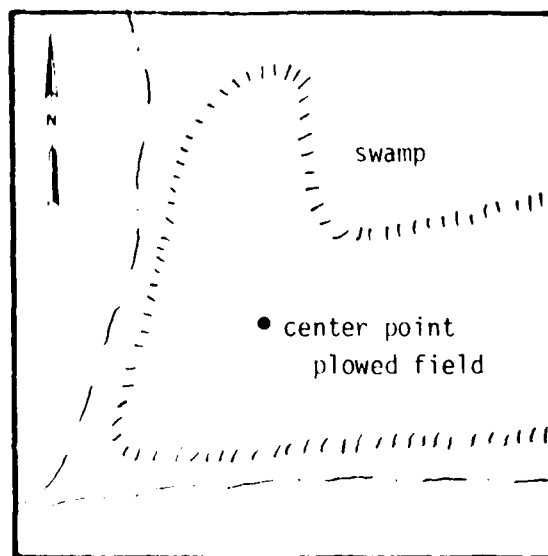


FIGURE 77. SKETCH MAP OF SITE 1Ma226.

1Ma226: Archaeological Investigations

The area around the site is dominated by bottomland woods and marshy conditions associated with the bottomlands. The rise on which the site is located is currently in use as farmland, and, at the time of survey, was plowed, with no appreciable ground cover.

Current Work: The site was recorded and defined during the project survey of selected portions of the study corridor. As illustrated in the site sketch map (Figure 77) the centerpoint, following the general surface reconnaissance, was situated at the apex of the north-south and east-west axis of the site.

Current Results: The site configuration is vaguely "L"-shaped, with the long axis being in the east-west direction. The radial program indicated that the highest artifact densities were in the eastern portion of the site. High count on any collection square was five, ten meters (32.8 feet) southwest of the centerpoint (Figure 78). Site size was determined to be 175 meters (574 feet) east-west, and 55

25 meter

PREHISTORIC
CONTOUR INTERVAL: 2 ARTIFACTS

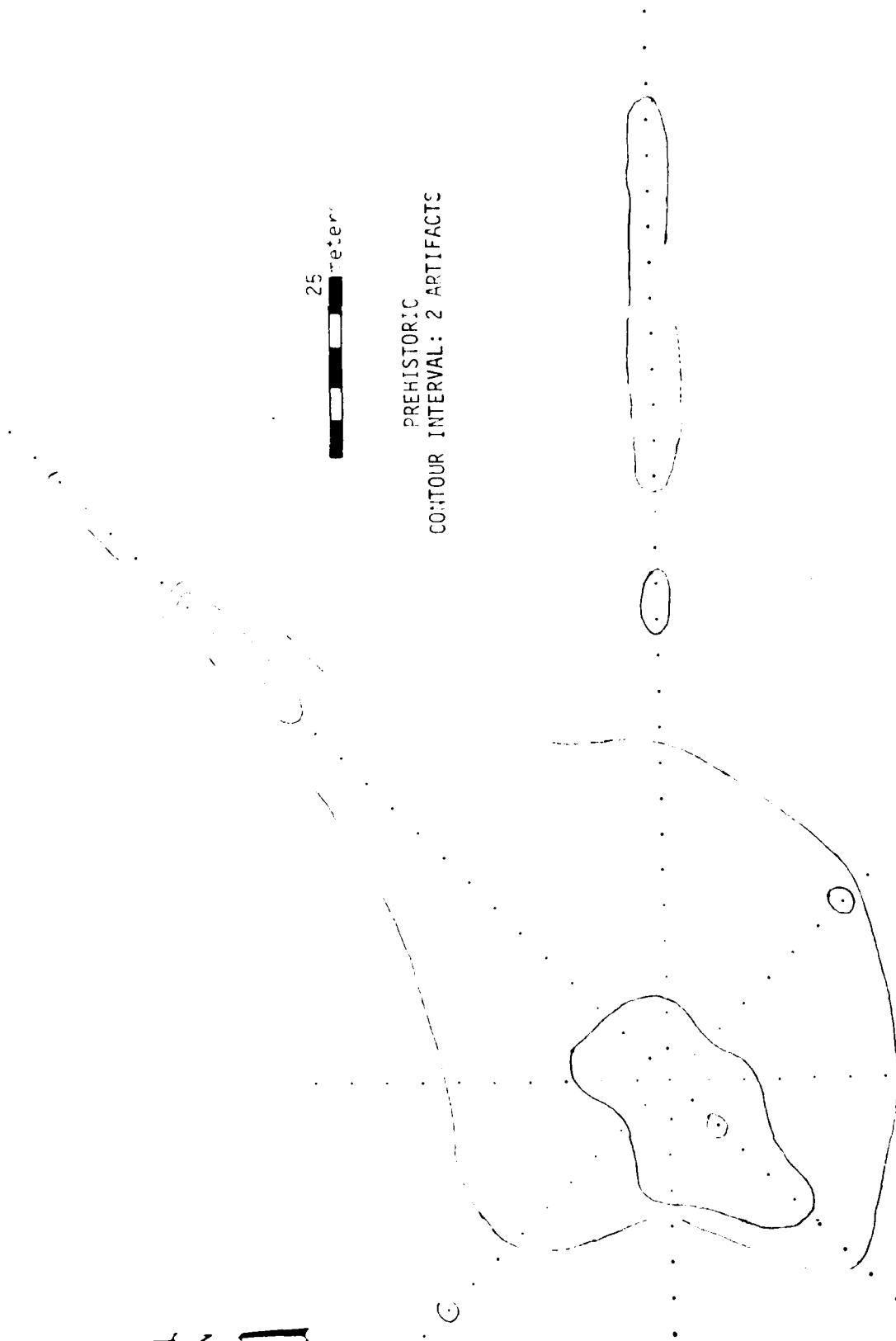


FIGURE 78. FREQUENCY CONTOUR MAP OF SITE 1Ma226 SHOWING RADIAL TRANSECT GRID.

meters (180 feet) north-south. Despite relatively high frequencies of artifactual material, no diagnostics were recovered during the survey of the site.

Table 29 lists, by morphological characteristics, the range of artifacts recovered. As can be noted, the artifact assemblage would seem to indicate that a full range of lithic manufacture was conducted at the site, and, despite the lack of diagnostics recovered during the survey, the site probably represents something other than a limited-activity or specialized-activity location (Plate 49).

TABLE 29. ARTIFACTS RECOVERED FROM 1Ma226.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flakes, unmodified	
Primary	2
Secondary	6
Tertiary	22
Flake frag., unmodified	
Secondary	6
Tertiary	51
Debris, unmodified	14
Core, unmodified	2
Unifacial tools	
Domed scaper/chopper	1
Side scraper	1
Bifacial tools	
Ovate to elongated	1
Backside scraper	1
Projectile points, unidentified	4
Groundstone	
Small battered cobble	1
Total	112

1Ma209: Introduction and Topography

1Ma209, although recorded during the survey portion of the project and subsequently tested, was originally reported to project personnel by Alexander (personal communication), who had encountered the site the previous autumn. The site is situated on an elongated rise, with highly variable width. The rise lies approximately between the Byrd Spring Lake bottomland, one to 1.5 kilometers (.6 to .9 miles) to the north, Huntsville Spring Branch, 1.2 to 1.8 kilometers (.75 to 1.1 miles) to the northwest, and the upland, one kilometer (.6 miles) to

the south, which form part of the boundary of Huntsville Spring Branch Basin. The rise is separated from the first two zones by broad, low-relief, swampy bottomlands, and from the third zone by boggy depressions, drainage swales, and a bottomland knoll.

The site occupies the central, highest portion of this rise, which, here, is some 150 meters (492 feet) broad, with a crestal elevation some three meters (9.8 feet) above adjacent depressions (Figure 79). Slopes of five to ten percent descend from the broad crest to two depressions, an elongated one which parallels the rise on its northern and northwestern side, and another, more restricted, depression on its southern side. East and southwest from the site, the rise continues. There is no evidence either of stream channels, springs, or seeps around the site. The nearest possible sources of water for the site occupants would probably have been in the adjacent ponds, but that remains a point of conjecture.

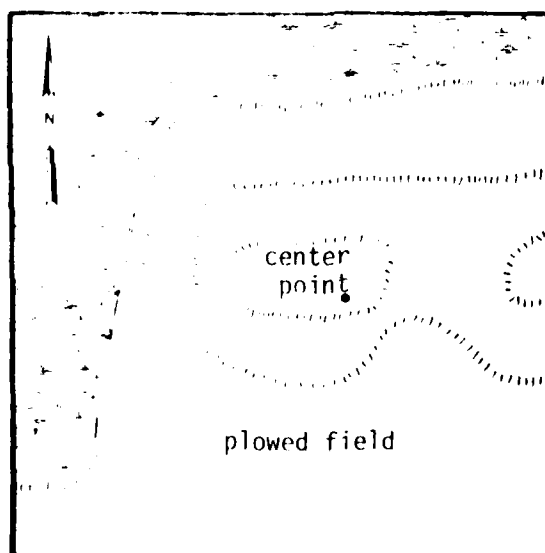


FIGURE 79. SKETCH MAP OF SITE 1Ma209.

Local chert, potentially workable, might have been present in gravel bars in the Huntsville Spring Branch channel, which could have been anywhere between 700 and 1000 meters (2,296 and 3,281 feet) from the site in prehistoric times. A nearly continuous complex of irregular rises could be followed from the site nearly to the bank of the stream. A potential source of chert are Mathis and Weatherly Mountains, approximately four kilometers (2.5 miles) to the east.

1Ma209: Archaeological Investigations

As noted, the site was originally verbally reported by Alexander to project personnel. Senior personnel accompanied Alexander to the site location, and a general surface reconnaissance, which included random collections, was made prior to the formal survey of the site.

Current Work: Other than for Alexander's visit to the site during the autumn preceding the project, no previous investigations of the locality are known. Although the survey team visited the site location in order to record it for formal submission to the University of Alabama site files, no formal survey radial program was conducted by them. It had been determined prior to their visit that 1Ma209 would be tested; therefore, the excavation crew would handle the radial boundary determination procedure.

Following the casual surface inspection, a radial procedure was conducted at the site. As indicated in the figures, 80 and 81, two overlapping components are present at the site, one historic, and the other prehistoric. The prehistoric component is elliptical in plan, conforming roughly to the elongated shape of the rise (Figure 80). Prehistoric materials appear on the surface over a distance of 120 meters (393 feet) east-west, and 85 meters (278 feet) north-south. A zone of high artifact density is evident along the north-south centerline. Frequencies of materials in each of the collection squares ranged from five to ten artifacts in the high-frequency zone. Toward the peripheries of the site, artifact counts dropped to one, two, or three specimens per collection square. At the time of the radial procedure, standing water was present to the north and west of the site area; therefore, the radials could not be extended beyond the points indicated. To the east, the artifacts terminate at a low, slightly depressed area.

Still farther east from the slight depression, about 100 meters (328 feet) beyond the limits of artifact distribution, the elevation again increases to a definite rise. Casual investigation of the rise yielded a light lithic scatter. However, because of the low artifact densities on the eastern rise (much lower than at 1Ma209), and due to the intervening zone devoid of artifacts, it was determined to limit testing at the site to the area indicated on the radial artifact density map. Toward the southern margin of the site, the rise elevation drops with artifact frequencies diminishing with lowered elevation.

While the prehistoric component tended to be present over the entire rise, the historic component is concentrated on the southwest portion of the elevated rise (Figure 81). The spatial distribution of the historic materials partially overlaps the prehistoric component, but the zone of highest historic artifact density is centered slightly to the west of the prehistoric component (Figure 81). It is possible, of course, that the activity at the historic site obscured the distribution of prehistoric materials in the western portion of the site.

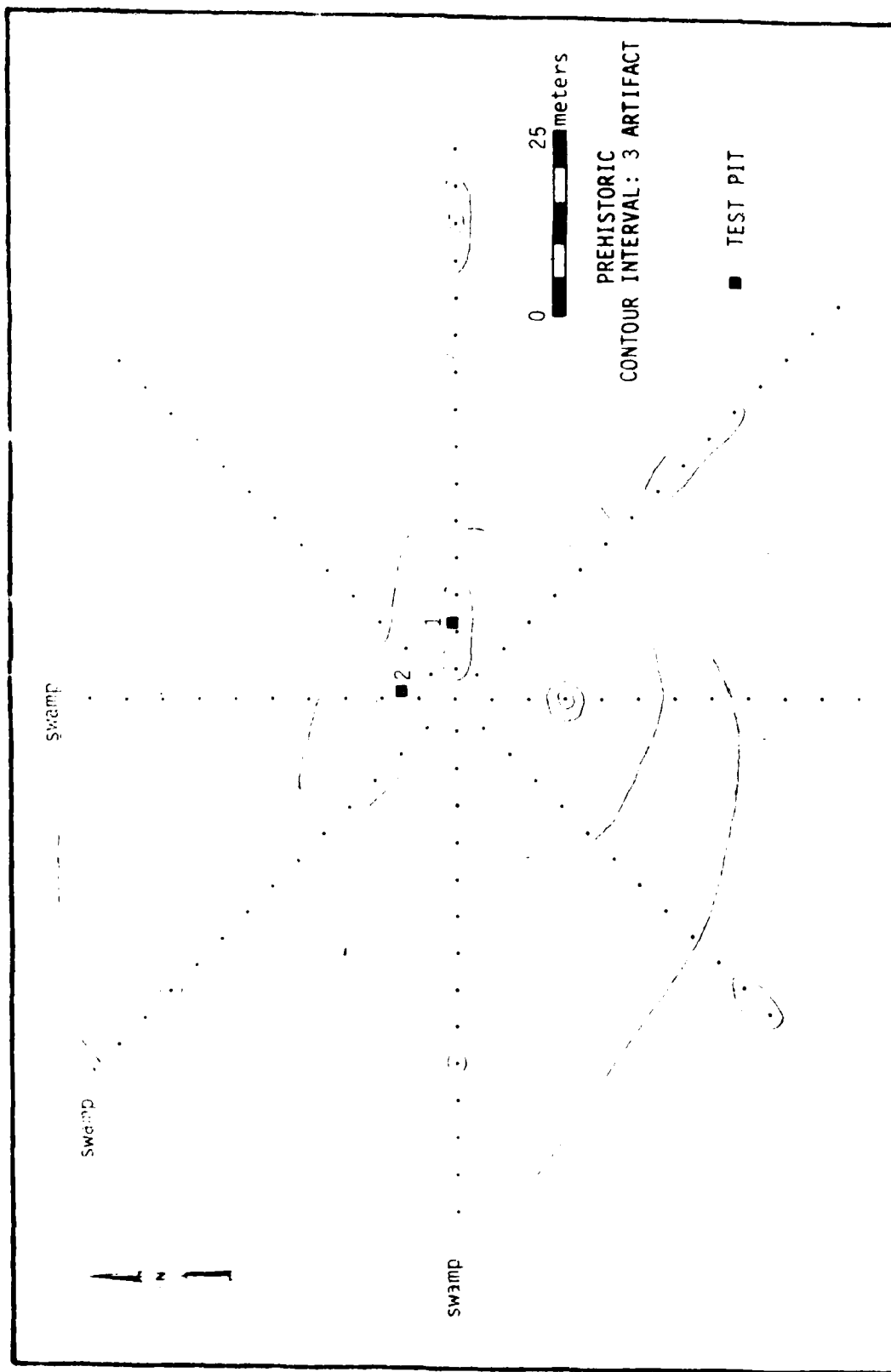


FIGURE 80. FREQUENCY CONTOUR MAP OF SITE 11A209 SHOWING RADIAL TRANSECT GRID AND TEST PITS PREHISTORIC COMPONENT.

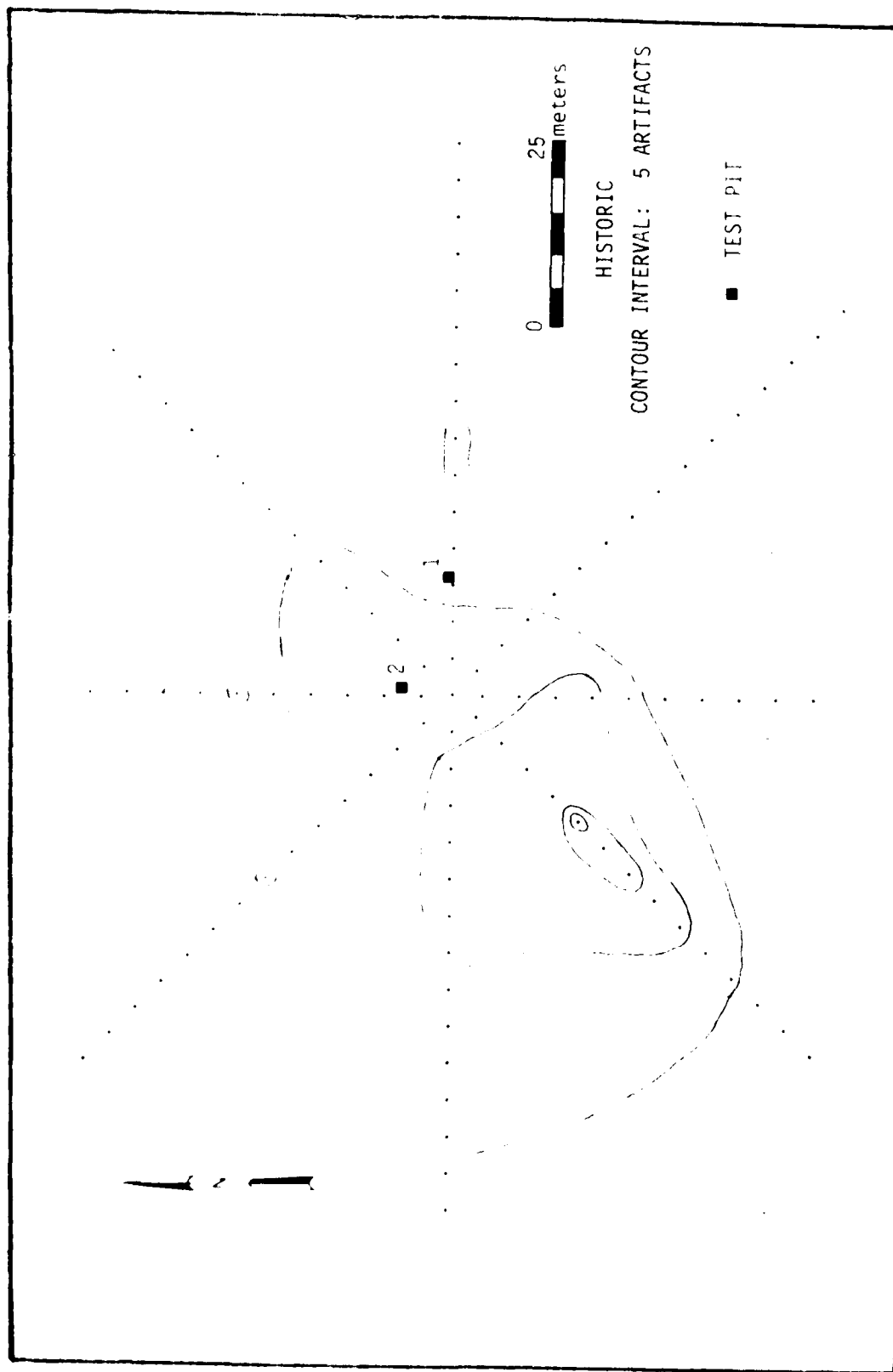


FIGURE 81. FREQUENCY CONTOUR MAP OF SITE 1Ma209 SHOWING RADIAL TRANSECT GRID AND TEST PIT HISTORIC COMPONENT.

ent, at present, the results clearly show different primary core areas for the two components.

On the basis of the initial procedure, the two test pits were placed in high artifact frequency locations. While test Pit 1 was located in the prehistoric component, test Pit 2 overlapped both the prehistoric and the historic components.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 41 centimeters (16.1 inches) below present ground surface. Two strata were defined in the unit. Stratum 1, a dark reddish-brown (2.5YR 3/1) silty clay loam, was the plowzone. Evidence of plowed-under corn cobs was noted ten centimeters (3.96 inches) below the present ground surface. All artifactual material recovered was confined to Stratum 1. While the majority of artifacts recovered was prehistoric, broken glass and one brick fragment were identified from the lower levels of the stratum, indicating the degree of disturbance throughout the stratum. Stratum 2 was a sub-plowzone, dark-red (2.5YR 3/0) silty clay loam that was sterile of artifactual material.

Test Pit 2 was also excavated in three arbitrary levels to a depth of 41 centimeters (16.1 inches) below present ground surface. The profile was virtually identical to that of test Pit 1, though Stratum 1 is slightly lighter than Stratum 1 in test Pit 1. Also a reddish-brown (2.5YR 3/1) silty clay loam, the plowzone stratum produced all of the artifactual material recovered from the unit. Although it overlapped with the prehistoric component at the site, the majority of artifacts recovered from the unit was historic, and included glass and ceramics. Stratum 2 is a sub-plowzone dark-red (2.5YR 3/0) silty clay loam, which was sterile of artifactual material.

Originally, it had been planned that a grader cut be put into the area of the prehistoric component. Inclement weather, however, did not allow for access of heavy machinery into the site area; therefore, a series of 15-meter (49-foot) interval auger lines was placed, running north-south across the site. Along each of the three auger lines, auger holes were placed at five-meter (16.4-foot) intervals. Evidence of neither mounds nor features was identified during the course of the augering procedure.

The investigations reveal evidence of Early through Late Archaic occupation, in addition to Middle and Late Woodland occupations (Plate 1). Besides the prehistoric components, there was a well-defined historic component (Plates 2 and 3). Artifact density for the prehistoric components were relatively moderate considering the number of occupations represented; however, ten diagnostic projectile points and five projectile point fragments were found (Table 30). Since none of the projectile points were recovered from excavations, it is not possible to separate the prehistoric components. However, based solely on the frequency of diagnostics, the Late Archaic and Middle Woodland occupations appear to have been the most intense.

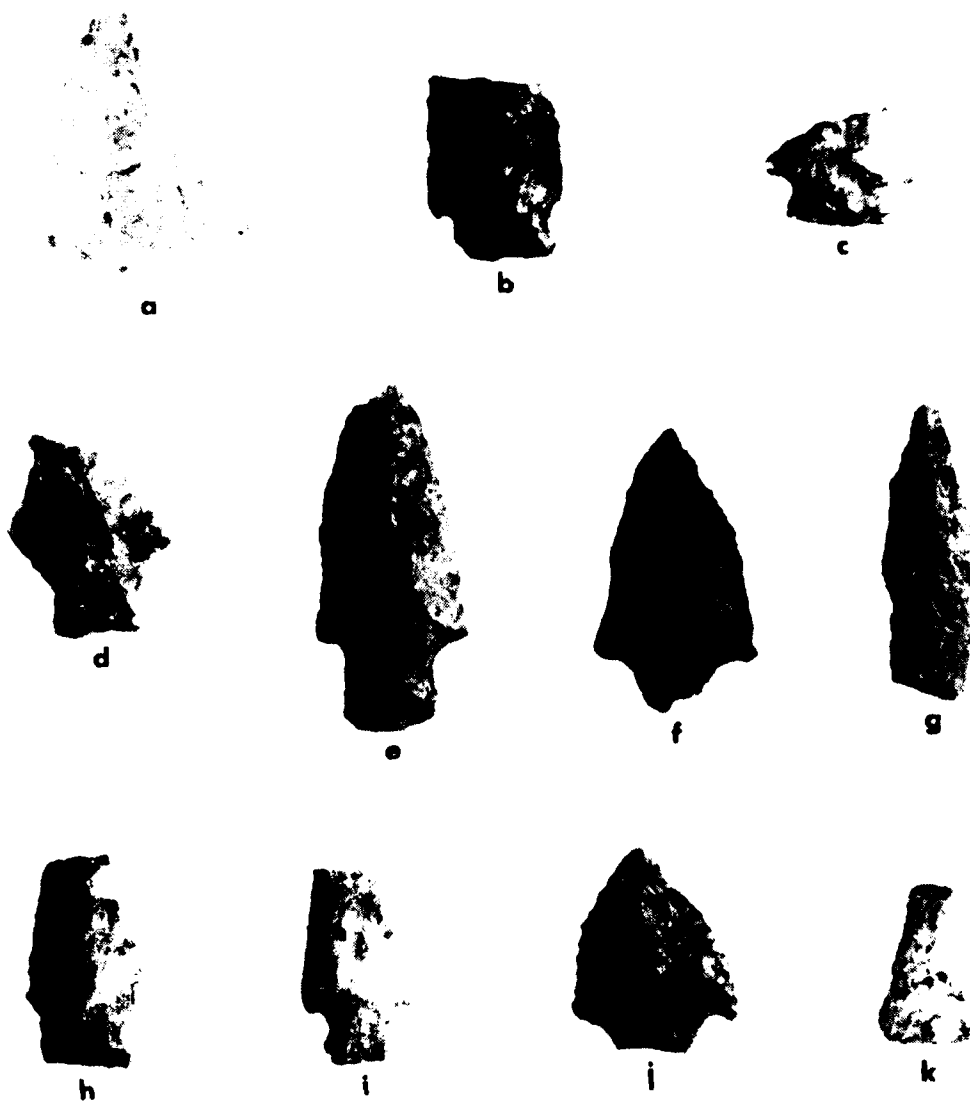


PLATE 50. PROJECTILE POINTS FROM 1Ma209.

a, Morrow Mountain Rounded; b, Benton Stemmed; c, Type 112; d, Type 101; e, Little Bear Creek; f, Gary; g, Bradley Spike; h, Yarbrough; i, Type 62; j, unidentified Projectile Point fragment; k, Drill fragment.



PLATE 51.

HISTORIC ARTIFACTS FROM 1Ma209.

a, Ironstone fragment, underglaze hand-painter decoration; b undecorated ironstone fragment, feather-edged; c, Ironstone fragment, blue stippled transfer-printed; d, Ironstone fragment, polychrome annular decoration; e, Stoneware fragment, mercury lead glaze; f, Amethyst bottle fragment, tool-applied lip; g, Aqua patent medicine bottle fragment; h, unidentified clear bottle, automatic manufacture.

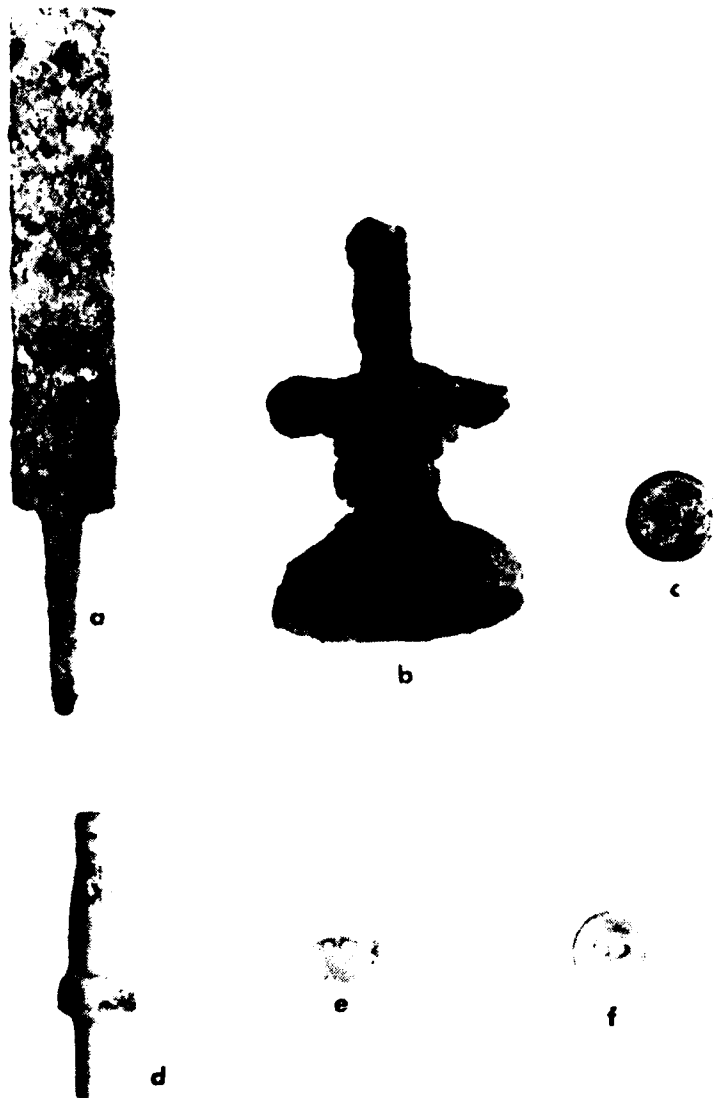


PLATE 52. HISTORIC ARTIFACTS FROM 1Ma209.
a, Iron File; b, Door Knob Shaft; c, Pants
Button "Hercules"; d, "Champion" Spark Plug;
e and f, Shell Buttons.

TABLE 30. ARTIFACTS RECOVERED FROM 1Ma209.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Primary	2	2	1	5
Secondary	6		1	7
Tertiary	36	1	9	46
Flake frag., unmodified				
Primary	1	1		2
Secondary	4			4
Tertiary	78	1	8	87
Debris, unmodified	55	9	5	69
Flakes, modified				
Tertiary	1			1
Flake fragments, modified				
Tertiary			2	2
Debris, modified	2			2
Core, unmodified	9	1	2	12
Unifacial tools				
Domed scraper/chopper	1			1
Transverse scraper	1			1
Side scraper (quartzite)	1			1
Notched flake			1	1
Bifacial tools				
Knife	1			1
Small flat ovate	1			1
Preform	1			1
Unid. frag., w/scraping				
use	1			1
Drill	1			1
Unid. frag., no				
apparent use	5			5
Back side scraper	3			3
Projectile points				
Knife/proj. pt. frag.	4			4
Type 112*	1			1
White				
Morrow Mountain rounded	1			1
Benton stemmed	1			1
Gary	1			1
Type 101*	1			1
Little Bear Creek	1			1
Bradley spike preform	1			1
Yarbrough	1			1
Type 62*	1			1
Unid. proj. pts.	10			10
Groundstone				
Large battered cobble	1			1
Total	235	15	29	279
* Faulkner and McCollough 1973				
HISTORIC				
Glass				
Patent medicine bottle,	1			1
snapcase aqua				
Jars, Mason	1			1
Aqua				
Jars, other	1			1
Aqua				
Unid. bottle				
Aqua	3			3
Clear	18		2	20
Brown	9		1	10
Amethyst	3			3

2

Patent medicine bottle,	1			1
snapcase aqua				
Jars, Mason	1			1
Aqua				
Jars, other	1			1
Aqua				
Unid. bottle	3			3
Aqua	18			20
Clear	9	2		10
Brown	3	1		
Amethyst				
Unidentified				
Whole bottle	1			1
Clear pressed glass	1			1
Milk glass				
Unid.	1			1
Lid sealers	3			3
Medicine bottles, post-1920				
Clear		1		1
Ceramic				
Ironstone				
Undec.	21			21
Featheredge	1			1
Blue transfer print	1			1
Polychrome	1			1
Underglaze, hd-pt.	1			1
Stoneware				
Mercury lead glaze	2			2
Lead glaze	1			1
Brown slip glaze	7			7
Mat lead glaze	1			1
Glaze undetermined	1			1
Metal				
Iron				
Unid.	1			1
Door knob shaft	1			1
Hook	1			1
Small file	1			1
Motor casing fragment	1			1
Bar or brace	1			1
Plow head	1			1
Mod. wire nail	1			1
Tin alloy				
Cap	1			1
"Hercules" pants button	1			1
Miscellaneous				
"Champion" spark plug	1			1
Shell button	2			2
Graphite fragment	1			1
Brick fragment	1			1
Drainage pipe fragment	1			1
Shoe sole fragment	3			3
Total	98	1	4	103

Historic artifacts (Table 30) would seem to indicate that the occupation occurred late in the 19th century or, possibly as late as right before World War II. The presence of mercury lead-glaze and mat lead-glaze ceramics tend to place the occupation in the earlier portion of this century, and that conclusion is reinforced by the presence of post-1920 medicine bottles, mason jars, and a Champion spark plug (Plates 51 and 52).

1Ma133: Introduction and Topography

1Ma133 produced the only in situ burials uncovered during the course of the project. Both burials were animal, one a bear, and the other a deer. In association with the burials were several Wade projectile points. The location and topographic situation of the site, not to mention the artifactual material and probable cultural affiliations, make it one of the more interesting tested during the course of the work.

1Ma133 is situated on a relatively narrow tongue (100 to 300 meters or 328 to 984 feet wide) of higher ground, which extends south along the western side of Huntsville Spring Branch, from the uplands along the northern border of the Huntsville Spring Branch Basin (Figure 82 and Plate 53). In several places, the higher ground has been incised by bends of the stream, leaving cutbanks. The highest portion of this tongue of higher ground is an isolated knoll, on which 1Ma133 is located. The knoll measures some 175 meters (574 feet) north-south, and some 150 meters (492 feet) east-west. The knoll occurs at the narrowest portion of the elongated rise, with a westward bend of the branch on its east side, and a slight depression on the west. Elevations on the knoll crest are three meters (9.8 feet) above the rise surface, 3.5 meters (11.4 feet) above the bottom of the western depression, and approximately 3.5 meters (11.4 feet) above the bank across Huntsville Spring Branch. Slopes on the western side of the knoll are approximately five per cent, but, on the eastern side, they approach twenty per cent, because of erosion of material into the branch. The knoll, and the rise north and south of it, were formed on material weathered in situ from limestone bedrock (Trenches II 21-2 and II 21-3 encountered secondary angular chert masses, which probably form the core of this knoll).

It is not possible to confirm that the branch was flowing along the east side of the knoll during prehistoric times. The alluvial bottom here is nearly one kilometer (.6 miles) wide. No evidence of relict channels was detected in the swamp to the east, although historic increases in sediment supply could have completely obscured them. To the west, the boggy depression is an extension of the swampy McDonald Creek alluvial bottomland. McDonald Creek presently lies one kilometer (.6 miles) west of the site. It is safe to say that potable water was probably present as close as a pond in the depression and/or the branch flowing along the base of the knoll.

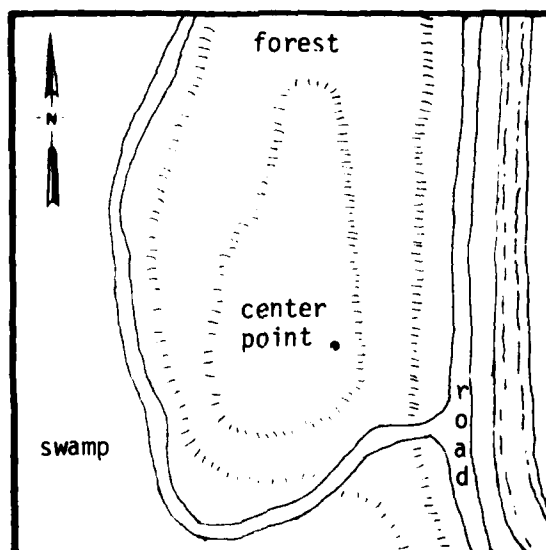


FIGURE 82. SKETCH MAP OF SITE 1Ma133.



PLATE 53. 1Ma133 AERIAL VIEW LOOKING WEST. HUNTSVILLE SPRING BRANCH CHANNEL IS IN THE FOREGROUND, WHILE THE SITE IS SITUATED TO THE FRONT AND WITHIN THE STAND OF DARK PINE.

The source of the lithic materials found at the site is less certain. Local chert was probably available from Madkin Mountain, approximately 3.5 kilometers (2.1 miles) northwest of the site, across the McDonald Creek bottomland portion of the basin. Fragments of Hartselle formation sandstone could also have been brought from outcrops on Madkin Mountain. Travel to the mountain would not involve crossing the branch, as would travel to other outcrop areas of the Hartselle sandstone -- for example, southwest to Bell Hill (approximately five kilometers, or 3.1 miles), or northeast to Garth Mountain (approximately six kilometers, or 3.7 miles).

1Mal33: Archaeological Investigations

The knoll on which the site is situated presently supports a pine community, with marsh-associated trees and shrubs apparent along the downslope edges of the knoll to the west (Plates 54 and 55). Displacement of channel spoil along the eastern edge of the site, road clearance, and some bulldozing activity in the southeastern quarter, has allowed for the development of a tall grass community. The relatively heavy overgrowth necessitated a shovel-pitting program during the initial site definition procedure.

Previous Work: Alexander originally identified and recorded the site during the 1978 survey of portions of Redstone Arsenal (1979:98-99). He identified the site as a village, with an accumulated midden of from one to two meters (3.28 to 6.6 feet). Depth of cultural deposits was evaluated on a series of shovel tests, placed in a non-systematic manner across the site. The resulting artifact assemblage included Morrow Mountain and Sykes-White Spring projectile points, plus one sherd each of McKelvey and Mulberry Creek Plain. In addition, eight biface and biface fragments, three biface reductions, seventy-five flakes, two cores, and a biface core chopper, were recovered. On the basis of the artifact assemblage, specifically the diagnostics, Alexander indicated a general cultural affiliation of Archaic and Woodland periods for the site.

Current Work: As noted previously, relatively dense vegetation over the knoll necessitated the utilization of a shovel-testing procedure along all of the radials (Figure 83). The major axis of the site, as defined by the radials, is approximately 130 meters (426.5 feet) north-south. The dredging and spoil-dumping along the eastern periphery, and the presence of swamp along the western periphery, has obscured both boundaries, and both features limit the east-west extent of the site to approximately 100 meters (328 feet).

However, the radials indicate that the site encompasses the major portion of the knoll. Artifact frequencies are extremely low along the east, northwest, and southeast margins of the site, a fact which is explained by the spoil-dumping and road construction in these areas. In the remainder of the site, artifact frequencies are very unevenly distributed. Several clusters of high artifact densities were located by the shovel pits; however, no real patterning to their



PLATE 54. IMA133 VIEW FROM THE EASTERN EDGE OF THE SITE
SOUTH ALONG THE HUNTSVILLE SPRING BRANCH CHANNEL.

PLATE 55. IMA133 LOOKING NORTHWEST
FROM THE VICINITY OF TEST
PIT 1 TOWARD THE KNOLL
CREST.



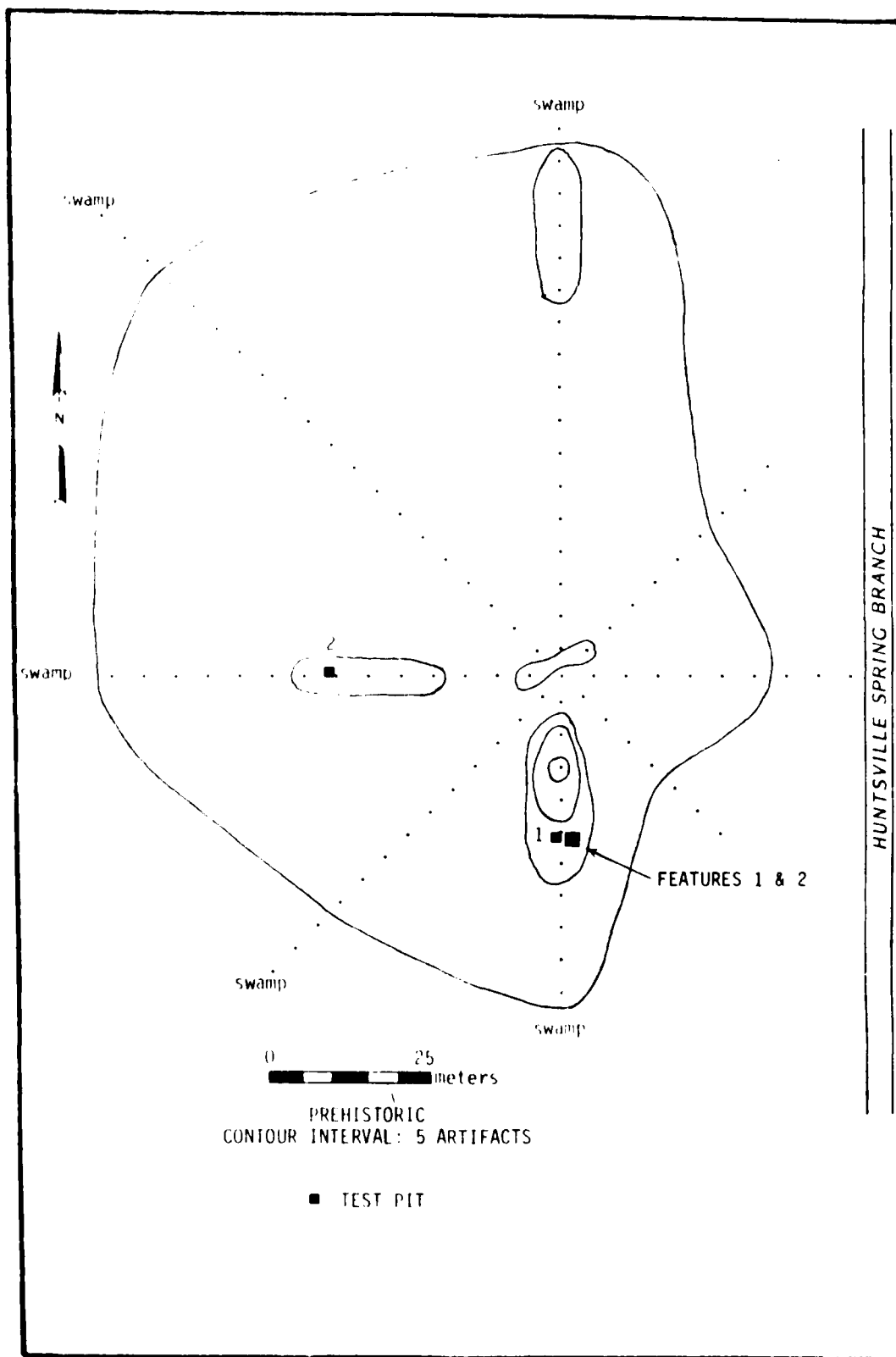


FIGURE 83. FREQUENCY CONTOUR MAP OF SITE 1Ma133 SHOWING RADIAL TRANSECT GRID, TEST PITS AND FEATURES 1 & 2.

distribution is apparent. Rather high artifact densities were found on the swamp margin near the periphery of the site on the north, northwest, and west, but it is unclear whether this cluster of cultural materials represents an activity locus, or is a consequence of erosion's displacing artifacts downslope. In an effort to clarify the question, one of the two test pits initially placed in the site was located along the western radial on the downslope margin of the knoll. Both test pits were placed in high artifact frequency areas.

Current Results: Test Pit 1, situated 20 meters (65 feet) from the arbitrary centerpoint on the south radial, was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface (Plate 56). Three strata were defined in the unit. Stratum 1 is a thin (four centimeters or 1.6 inches) veneer of humus, which overlies Stratum 2, a dark-reddish-brown (2.5YR 3/4) silty clay loam showing both small and large root activity. All artifactual material recovered from the unit came from Strata 1 and 2. Stratum 3, the B horizon consists of a 2.5 YR 3/6 dark red silty clay loam. The break between Strata 2 and 3 is extremely sharp, with no transition zone apparent. Such a sharp distinction is not likely the result of natural soil developmental processes. Rather it appears that the upper zone (Stratum 2) has been secondarily deposited, perhaps through erosion over an exposed B horizon.



PLATE 56. 1MA133 TEST PIT 1 EAST PROFILE.

Test Pit 2, located on the downslope, western side of the knoll, exhibits a slightly different profile. Excavated in three arbitrary levels to a depth of approximately 30 centimeters (11.9 inches), two strata were defined in the unit. Stratum 1 is an 18-centimeter (7.09 inch) thick, dark-reddish-brown (5YR 3/2) humus/silty clay loam zone. The stratum has been disturbed by both large and small root activity. All cultural material recovered from the pit came from this stratum. The underlying, sterile Stratum 2 is also a reddish-brown (5YR 4/4) silty clay loam. No displacement of the A horizon, as was apparent in Test Pit 1, was present in Test Pit 2, thereby confirming, to a degree, the conclusion reached concerning the Test Pit 1 stratigraphy.

However, the apparent discrepancies between the two profiles, and the results of the radial program, with the erratic distribution of artifact clusters, led to a limited shovel-pitting procedure following the finalization of test pit excavation. In an effort further to define the stratigraphy in Test Pit 1, a shovel test, 50 centimeters (19.7 inches) square, was placed to the east of the pit by approximately 80 centimeters (31.5 inches) in order not to encounter residue backdirt from the Test Pit 1 excavation.

It was readily apparent, by approximately 20 centimeters (7.9 inches) below present ground surface, that the stratigraphic profile of the shovel pit was dissimilar to the Test Pit 1 profile, and that the shovel test was being excavated into a probable feature. Work was temporarily halted, and excavation removing the upper 20-centimeter (7.9 inch) thick humus and A horizon proceeded in 20-centimeter (7.9 inch) wide strips away from the shovel pit. The outline of a large, intrusive feature was delineated, and a more formalized excavation unit was laid out. The unit size was ultimately 1.5 meters (4.9 feet) east-west, and 1.75 meters (5.7 feet) north-south, with the size being determined by the feature outline (Plate 57).

The clearance of the A horizon overburden allowed for the delineation of the majority of a large stain, designated Feature 1 (Plate 57; Figure 84). Anticipating that the feature was similar to those excavated at 1Ma210, the matrix in the upper portion of the feature was removed by shovel and trowel and bagged in toto for waterscreening and flotation. During the course of the excavation of the upper portion of the stain, however, a second feature, subsequently designated Feature 2, was defined along the northern and southern margins of the Feature 1 pit outline (Figure 84).

Feature 1 is an irregularly shaped pit, originally dug to a maximum depth of approximately 126 centimeters (47.2 inches) below the present ground surface. During its construction the majority of Feature 2, which appears to be a sandstone and burnt clay concentration, was apparently removed. It is still unclear as to the probable function of Feature 2, however, it does clearly predate Feature 1. Subsequent to both features, the upper portion of the pit apparently was filled with trash, though a clean line of demarcation between the lower Feature 1 fill and the trash filling episode could not be discerned in the stratigraphic profiles.

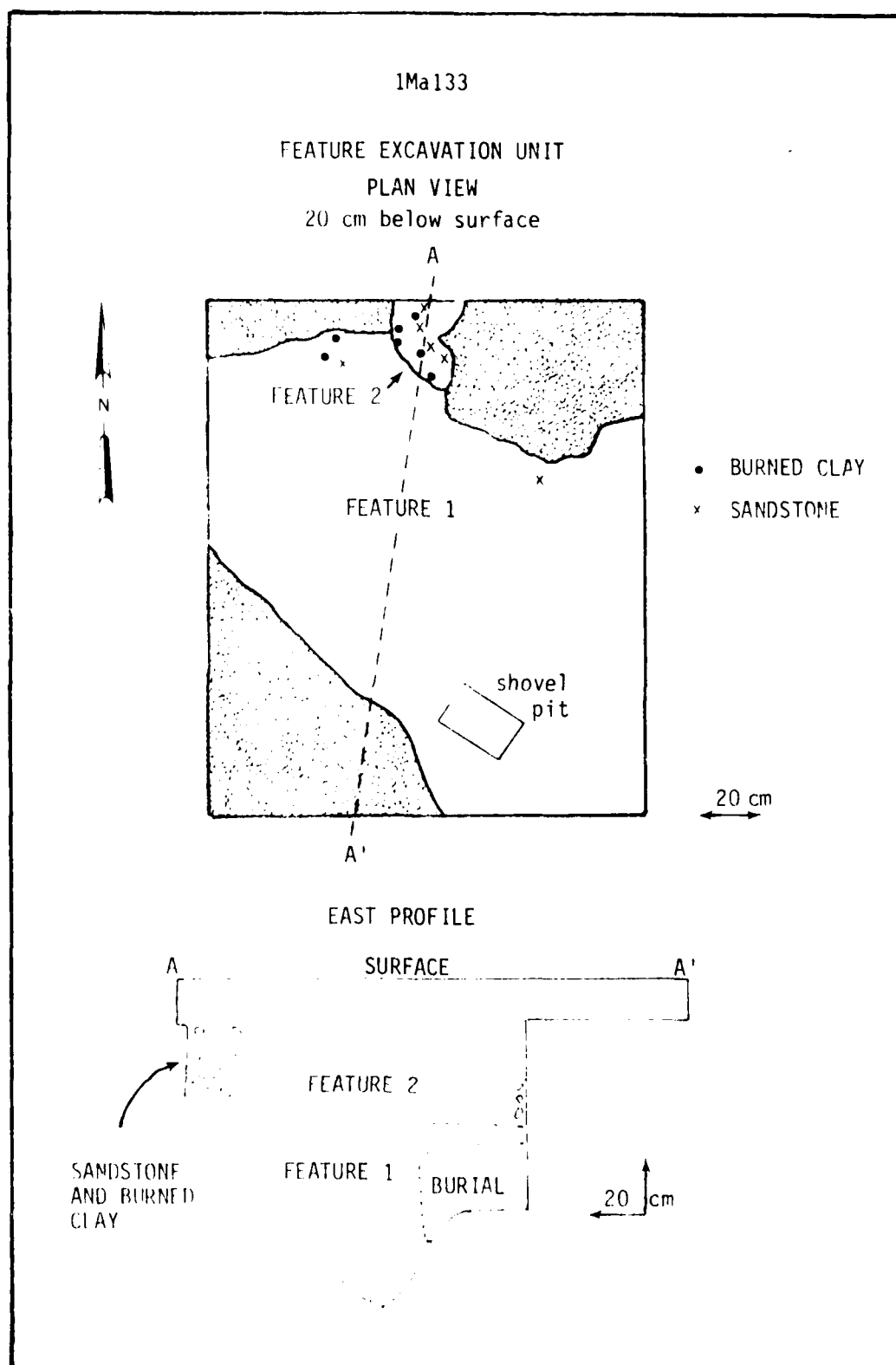


FIGURE 84. PLAN AND PROFILE OF FEATURE EXCAVATION UNIT AT SITE 1Ma133.

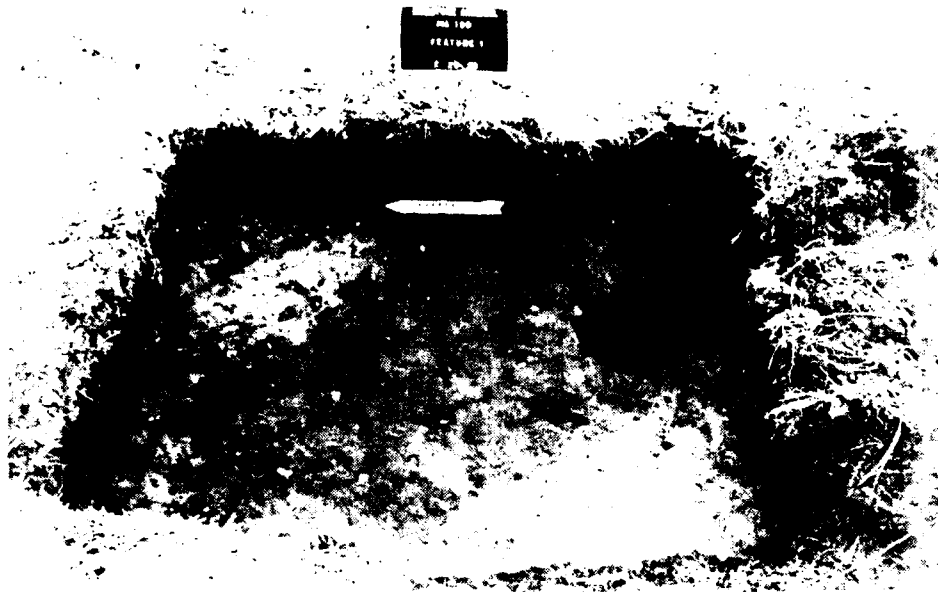


PLATE 57. 1 MA133 FEATURE 1 AS DELINEATED AT APPROXIMATELY 20 cm (8 in.) BELOW PRESENT GROUND SURFACE. INITIAL SHOVEL TEST TO THE RIGHT CENTER, WHILE TEST PIT 1 IS BARELY DISCERNABLE IN THE LOWER RIGHT FOREGROUND.

The Feature 1 pit is 64 centimeters (25.2 inches) north-south along its western side, and 134 centimeters (52.8 inches) along the eastern side. It should be noted that the feature continues into the western, eastern and southern walls of the excavation unit, but excavations were limited by time only to the area as outlined (Figure 85; Plates 58 and 59).

Feature 2, disturbed by the construction of Feature 1, is defined only on the basis of remnants of sandstone and burnt clay still present in the north and south walls of the pit (Figure 84). Fragmented pieces of burnt sandstone and clay were identified at levels corresponding to the first appearance of the north and south remnants and also mixed into the lower fill of the pit. No diagnostic materials were recovered from either of the Feature 2 remnants, though McKelvey Plain and Mulberry Creek Plain sherds were recovered from the fill level corresponding to the level of the remnants. The sherds are part of the final trash filling episode of the pit.

The upper fill of the pit contained quantities of Mulberry Creek Plain, McKelvey Plain, flakes and flake fragments (Table 31; Plate 60)



PLATE 58. 1MA133 FEATURE 1 AND 2 SOUTH PROFILE. NOTE THE DARKER SOIL CONCENTRATION TO THE LEFT SIDE OF THE PROFILE WHICH IS A CONTINUATION OF THE FEATURE 1 FILL. FEATURE 2 SANDSTONE IS EVIDENT IN THE PROFILE BELOW AND TO THE LEFT OF THE NORTH ARROW.



PLATE 59. 1MA133 FEATURE 1 AND 2 EAST PROFILE. NOTE THE SLIGHT COLOR DIFFERENTIATION BETWEEN THE UPPER AND LOWER STRATA WHICH IS INDICATIVE OF THE TWO FILLING EPISODES.

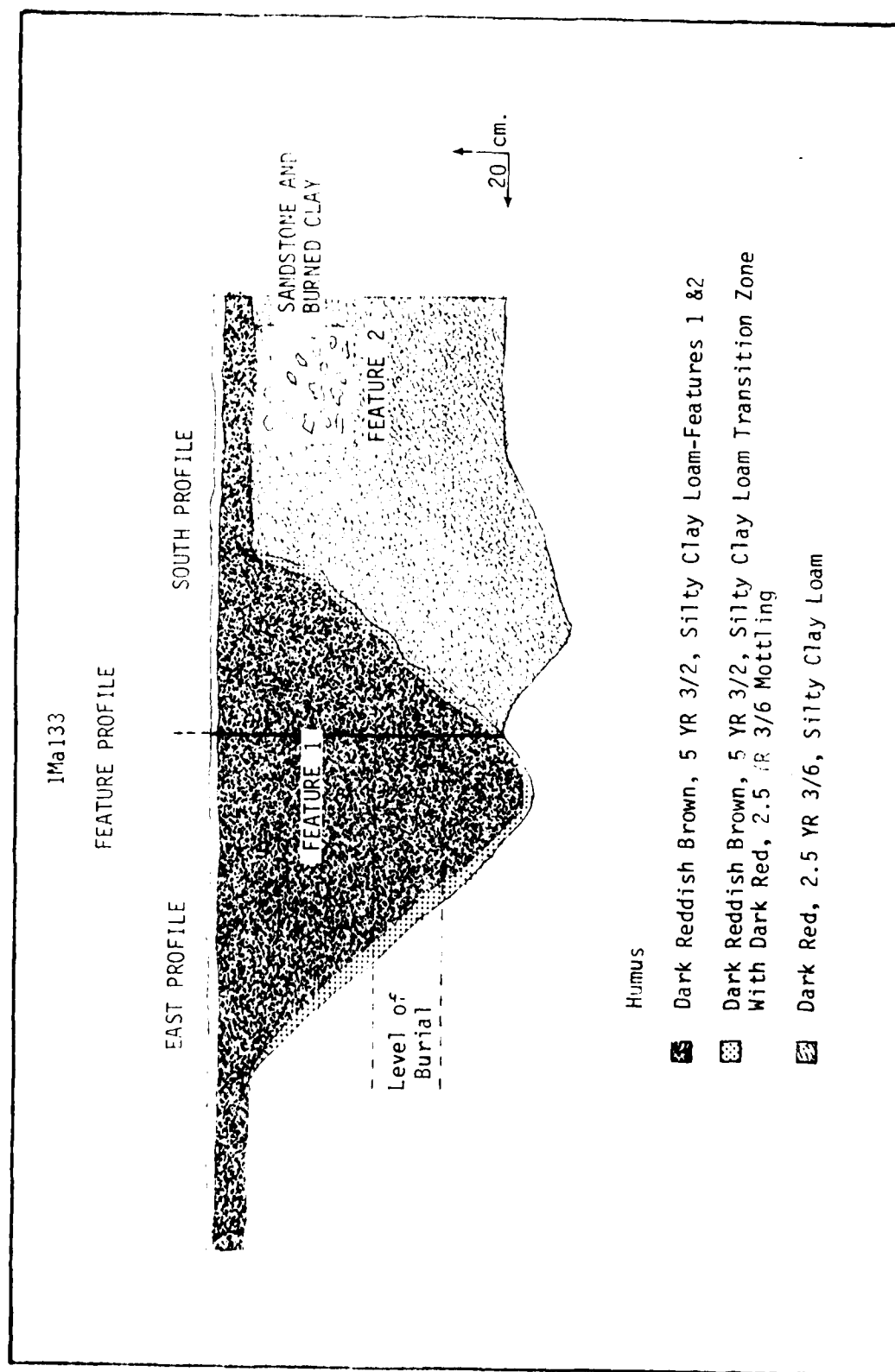


FIGURE 85. EAST AND SOUTH PROFILE OF FEATURE EXCAVATION UNIT AT SITE 1Ma133.

TABLE 31. ARTIFACTS RECOVERED FROM 1Ma133.

Surface, Radials, & S. P.	T.P. 1	T.P. 2	Fea. 1	Fea. 2	Backhoe Trench	Totals
CERAMICS						
Mulberry Creek plain	3		905	1		916
Plain bowl rims		4	27	1	3	28
Carinated? bowl rims			3			3
Bluff Creek simple-stamped		1	64	2		67
Bowl rims			5	1		6
McKelvey plain		1				1
Sand and clay (thick)			219	60		279
With mending hole			1			1
Sand and clay (normal thickness)			4			4
Possible complicated stamp (Pickwick complicated)			4			4
Benson punctate				1		1
Total	3	6	1232	66	3	1310
LITHICS						
Chipped stone			3			3
Primary form						
Flakes, unmodified					1	85
Primary	3	2	78			118
Secondary	22	1	90			926
Tertiary	57	17	797		2	
Flake frag., unmodified						
Primary	8	3				13
Secondary	5	5				18
Tertiary	90	32	923	1	5	1,110
Debris, unmodified						27
Flakes, modified						
Primary			1			1
Secondary			2			2
Tertiary			3			4
Flake fragments, modified						
Tertiary		1				
Debris, modified						
Core, unmodified	1	1	1			4
Blade	6	2	25	1		37
Unifacial tools	3	3	1			4
Domed scraper/chopper	1					
Transverse scraper			1			1
End scraper on flake		1				1
Side scraper			2			2
Denticulate flake		1	1			2
Spokeshave			1			1
Graver	1		2			3
Bifacial tools						
Knife						
Small flat ovate		1				1
Knife fragment		1				2
Back side scraper	1	3	2			6
Preform			1			1
Punch/graver	2					2
Unid. frag., scraping use	1		2			4
Drill			1			1
Projectile points						
Eva var.	1					1
Edgewood small			1			1
Gary			1			1
Flint Creek			2			2
Wade	2		8			10
Type 102-105 (Faulkner and McCollough 1973)						
Morhiss-like	1		1			1
Morhiss-like	1					1

[illegible]

HISTORIC

Unid. bottle amethyst	1
Total	1

BONE

NE			
Unid. frag. (3 pcs. seem burned)	12		
Bear mandible	1		
Deer mandible	1		
Bear humerus	2		
Bear femur	2		
Deer vertebra	2		
Girdle portion	8		
Bear ulna	1		
Basal skull portion	1		
Portion of skull (?)	1		
Deer humerus	1		
Deer metatarsal	1		
Bear tibia (?)	3		
Bear radial	1		
Rib fragments	8		
Phalange	2		
Unid. vert. fragments	5		
Humerus	1		
Fragments	1		
Total	54		

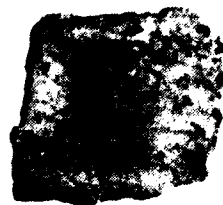
*Flotation
**3 pc. = 1 whole; 2 pc. = 1/2; remainder fragments



a



b



c



d



e



f



g



h



PLATE 60. PREHISTORIC CERAMICS FROM 1Ma133.
a-h, Mulberry Creek Plain.

within a dark reddish-brown (5YR 3/2) silty clay loam matrix. This upper fill corresponds in type and composition to Stratum 1 of Test Pit 2, which from artifact quantities is thought to be a disturbed midden horizon.

As noted, prior to the excavation of the stain, the artifact-bearing A horizon had been cleared away to delineate what was supposed to be the upper limits of the stain. The trash deposited in the area during the Late Woodland occupation, as indicated by the McKelvey and Mulberry Creek Plains, concentrated in the still-subsided Feature 1 pit, which apparently was never completely filled. Though no evidence of differentiation could be noted in the soil type of the two filling episodes, as mentioned earlier there was an increased occurrence of sandstone and burnt clay in the middle and lower levels of the pit. Approximately 65 centimeters (25.6 inches) below the cleared A horizon level, the first of a series of disarticulated bear and deer bones were encountered. The upper bone complex (Plates 61, 62, and 63) was composed of long bones, vertebrae, ribs, and skull fragments. Lying 30 centimeters (11.9 inches) below the upper portion of the burial were the left mandibles of a bear and a deer. All indications are



PLATE 61. 1 MA133 FEATURE 1 BURIAL 1. THE EXPOSED BONE IS THE UPPER CONCENTRATION WHICH WAS COMPOSED OF THE LONG BONES, VERTEBRA, AND RIBS OF BOTH DEER AND BEAR.

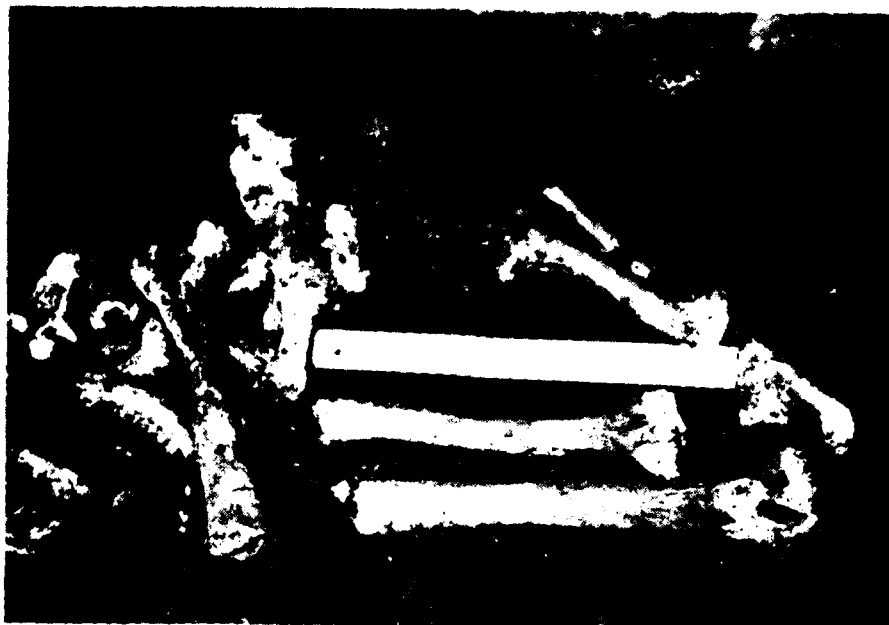


FIGURE 62. IMA133 CLOSE-UP OF THE UPPER PORTION OF BURIAL 1
ALL BONES IN THE BURIAL HAD BEEN DISARTICULATED.



PLATE 63. IMA133 FEATURE 1 BURIAL 1 THE LOWER PORTION OF THE
BURIAL. THE BEAR MANDIBLE IS IN THE LOWER SECTION
OF THE PLATE. BOTH MANDIBLES WERE SITUATED
APPROXIMATELY 15 cm (6 in) BELOW THE UPPER PORTION
OF THE BURIAL.

that both the lower and upper sections of the burial had been interred simultaneously, as several Wade points and gorget fragments were found throughout this portion of the fill (Plates 64 and 65). The majority of the gorgets were fragmentary and upon return to the laboratory, could be fitted together with other fragments which occurred between the upper portion of the burial and the lower. Although the majority of the Wade points were in the fill around the burial, at least five appeared to have been placed along the pit wall to the south and north of the burial. There was no indication of butchering noted on any of the bones, and the possibility exists that the burial was a secondary interment of selected parts of each individual.

The co-occurrence of the Wade points, and gorget fragments with the burial would appear to indicate that the Feature 1 pit and lower fill burial dates to the Late Archaic. If the reconstructed chain of events is correct, then the disturbed Feature 2 predates the pit construction, while the upper fill represents a Late Woodland trash deposition episode. Although we were unable to distinguish any differences in stratigraphy within the pit, the distribution of the artifacts tend to confirm the suggested sequence. In conclusion, 1Ma133 has a well-developed Late Archaic and Late Woodland component (Plate 66). The former is associated with the Feature 1 burial, while the latter is documented from surface materials and the upper zone of Feature 1.

Sites of the Boundary Canal Basin and Adjacent Uplands

Fifteen sites are located in the Boundary Canal Basin zone. The physiographic zone is characterized in Chapter 6 of this report, but its dominant feature is a series of lakes within the closed basin, which would have afforded both the prehistoric and early historic inhabitants of the area significantly enhanced natural resource bases. Of the 15 sites, two are classed as historic (1Ma152, 1Ma210), and the remainder are prehistoric (1Ma216, 1Ma217, 1Ma218, 1Ma190, 1Ma229, 1Ma210, 1Ma157, 1Ma159, 1Ma158, 1Ma154, 1Ma155, 1Ma156, and 1Ma153).

1Ma216, 1Ma217, and 1Ma218: Introduction and Topography

These sites lie on a gently sloping surface (mean slope is one to two percent), between the lower slopes of Bell Hill and the Boundary Canal bottomland. Local relief of this surface is less than 0.5 meters (1.64 feet). Site 1Ma216 is on a barely perceptible rise on an otherwise almost featureless slope (Figure 86). No present water-course is associated with it; however, it lies south of a shallow (less than 0.5 meters deep or 1.64 feet), southeast-trending swale, which received run-off from the northwestern side of Bell Hill. The original nature of drainage through the swale is not known. No stream channel was detected on the 1937 aerial photographs examined at the Facilities Engineer's offices. It is possible that a prehistoric stream channel was present; however, the precipitation catchment area of Bell Hill was probably not sufficient to supply a perennial stream.



PLATE 64. GORGET AND GORGET FRAGMENTS FROM 1Ma133.
a, Gorget; b and c, Gorget fragments.

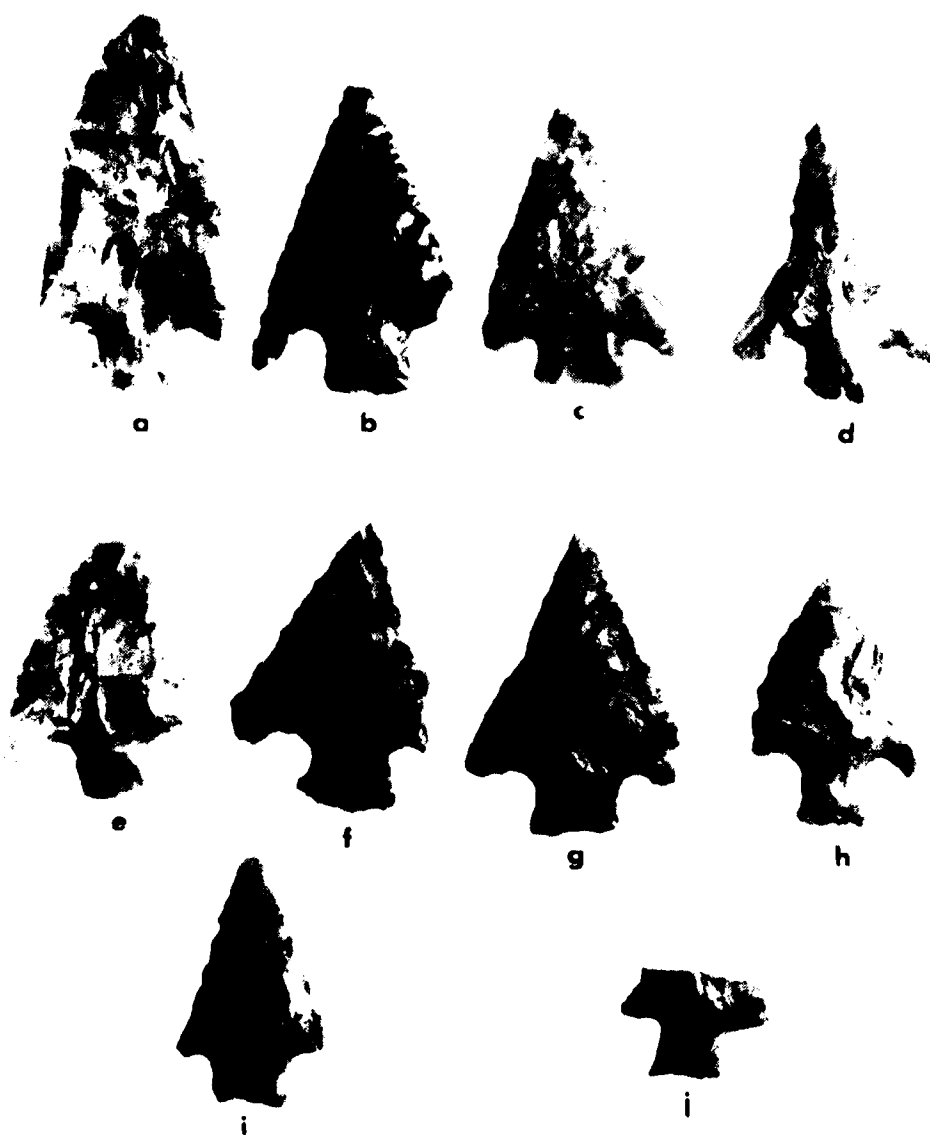


PLATE 65. PROJECTILE POINTS FROM 1Ma133.
a-j, Wade.

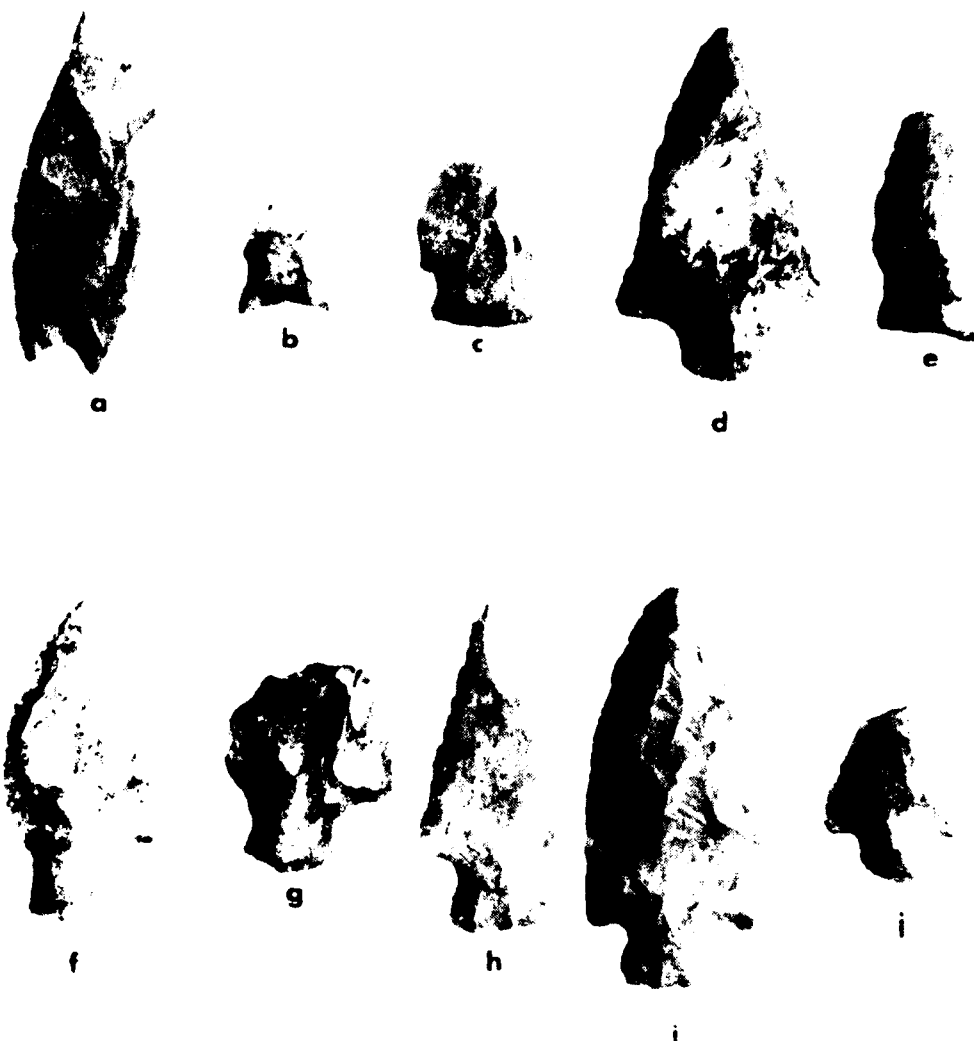


PLATE 66. PROJECTILE POINTS FROM 1Ma133.

a, Eva variant; b, Edgewood; c, Benton Broad Stemmed;
 d, Elora; e, Halifax-like; f, Morhiss; g and h, Flint
 Creek; i, Type 102; j, Gary.

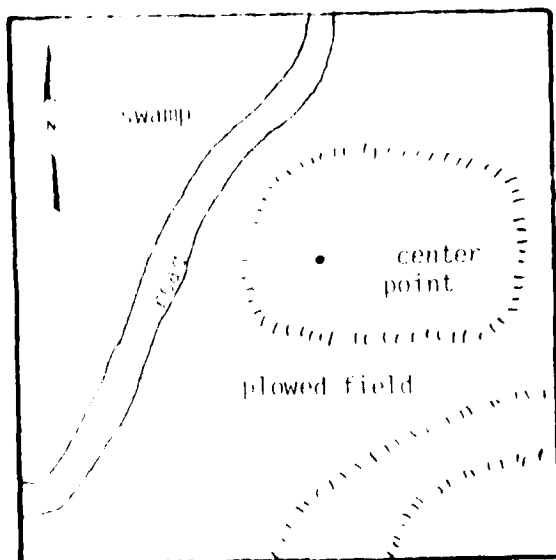


FIGURE 86. SKETCH MAP OF SITE 1Ma216.

The other two sites are better-placed for obtaining potable water. Site 1Ma217 lies on the northern side of the drainage swale described above, inside its juncture with another swale, which drains the upland north of Bell Hill (although poorly defined topographically, the nature of these swales is shown by the soil distributions; see Swenson et al. 1957:Plate 50). From Site 1Ma217, the ground slope increases slightly, down to a wooded, boggy depression, which leads west to the Boundary Canal bottomland, approximately 100 meters (238 feet) west of the site (Figure 87). This site might have been originally at the juncture of two streams, probably both ephemeral. A cane ticket in the depression near the site probably marks the presence of seeps, which are, possibly, perennial water sources.

Site 1Ma218 is on a narrow, north-south rise between the Boundary Canal bottomland and the southeast-trending drainage swale (Figure 88). The crest of this rise lies approximately three meters (9.8 feet) in elevation above the floor of the bottomland. Width of the rise is approximately 120 meters (393.7 feet). The sides of the rise at its northern end appear to be artificial, exhibiting irregular slopes of 50 percent or more, with small trash-filled pits and ridges on the crest. Natural slopes down to the depressions east and west of this site were probably less than five percent. During prehistoric occupations, inhabitants could have obtained water from the north-flowing natural stream (which exited prior to the digging of the Boundary Canal), no more than 100 meters (328 feet) to the west. A small pond might have been present in the drainage swale; other sources could have been the seeps, or the probably intermittent stream from Bell Hill, perhaps 15 meters (49 feet) away. Lithic materials were readily available on Bell Hill (see topographic discussion accompanying 1Ma222). These probably included, principally, local chert and sandstone.

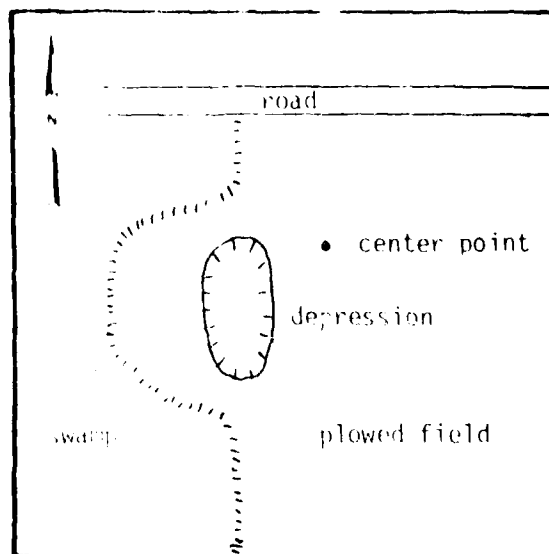


FIGURE 37. SKETCH MAP OF SITE 1Ma217.

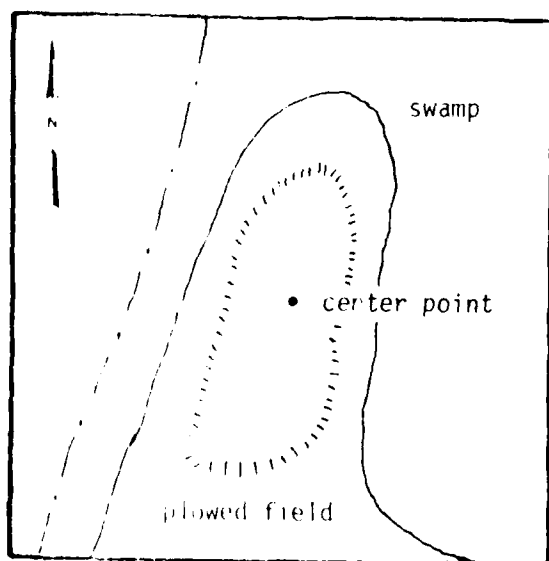


FIGURE 38. SKETCH MAP OF SITE 1Ma218.

1Ma216: Archaeological Investigations

The site was originally reported and recorded during the survey of selected portions of the study corridor, and was subsequently tested during the same project.

Current Work: At the time the site was recorded, it was identified by the survey team as a moderate lithic scatter. Prior to the testing program and radial boundary determination procedure, the survey team had flagged an arbitrary centerpoint, based on a general surface reconnaissance of the site area. The radials were run out from the survey-selected centerpoint, and indicated a relatively consistent frequency of the artifacts across the site (Figure 89). High frequency for any collection square was six along the northeast radial, but counts of four and three were also encountered along the north, northwest, east, and southwest radials. On the basis of the radials, a primary core size is 75 meters (246 feet) north-south, and approximately 75 meters (246 feet) east-west, with a light scatter running northeast-southwest for 65 meters (213 feet). Total site area is 5,950 square meters (7,116 square yards). The artifact assemblage from the radials included a wide range of lithic classes, and five diagnostic projectile points, including an Afton, Cypress Creek Morhiss-variant, Flint Creek, and a type most closely similar to Type 82 (Haulkner and McCollough 1973) (Table 32; Plate 67). The variety of artifacts, and the consistent distribution of material across the extent of the site, resulted in the placement of the two test pits in high and medium frequency locations.

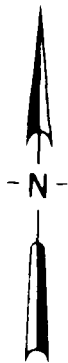
Current Results: Test Pit 1 was excavated to a depth of 20 centimeters (7.9 inches) in two arbitrary levels, and two strata were defined. Stratum 1 is a redder than reddish-brown (2.5YR 4/4) silty loam plowzone, approximately 18 centimeters (7.09 inches) in depth. Only four artifacts were recovered from the unit, all from Stratum 1. The underlying sterile Stratum 2 is a red (2.5YR 4/6) silty loam.

Test Pit 2 was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches), and exhibited an identical stratigraphic sequence to that of Test Pit 1, although the Stratum 1 plowzone is slightly shallower (averaging 16 centimeters or 6.3 inches).

Although we had anticipated conducting either an augering or stripping program at this site, inclement weather, resulting in extremely muddy conditions, precluded any additional work. The diagnostics recovered during the investigations would indicate that the site was occupied during late Archaic times and possibly into the Early Woodland period.

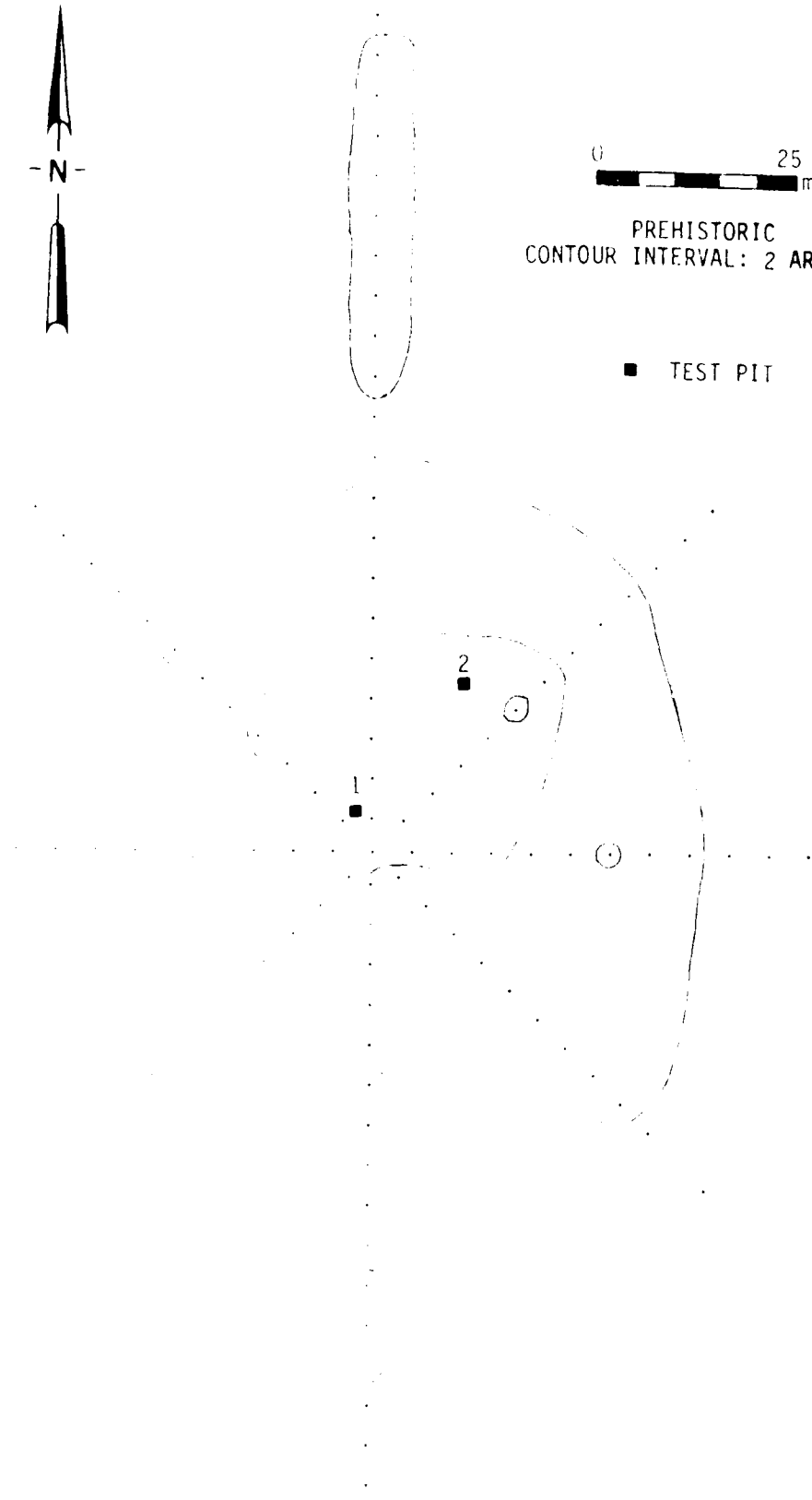
1Ma217: Archaeological Investigations

The site, located in a plowed field, was first encountered during the survey of the aligned random sample units within the project corridor. The site is in relatively close proximity to a major



PREHISTORIC
CONTOUR INTERVAL: 2 ARTIFACT

■ TEST PIT



MAP OF SITE 1Ma216 SHOWING RADIAL TRANSECT
PIT 1.

TABLE 22. ARTIFACTS RECOVERED FROM 1Ma216.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Primary	1			1
Secondary	3	2	1	6
Tertiary	22			22
Flake frag., unmodified				
Secondary	3			3
Tertiary	18		1	19
Debris, unmodified	25	2		27
Flake fragment, modified				
Secondary	1			1
Debris, modified	4			4
Core, unmodified	8			8
Unifacial tool				
Unifacial flake	1			1
Bifacial tool				
Flake, bifacial	1			1
Unifacial core	1			1
Notched end scraper	1			1
Core, bifacial				
Spall, bifacial fragment	1			1
Core	1			1
Yellow flint	1			1
Type 32*	1			1
Marine shell	1			1
Flint core	1			1
Ind. product	1			1
Total	96	4	2	102
PLASTIC				
Glass				
Soft drink	1			1
Ind. bottles				
Clear	1			1
Brown	3			3
Total	5			5

* Foulkner and McCollough 1973



PLATE 67. LITHIC ARTIFACTS FROM 1Ma216.
 a, Afton; b, Cypress Creek; c, Morhiss variant;
 d, Flint Creek; e, Type 82 (Faulkner and McCollough
 1973); f, Hafted Scraper; g, Bifacial Punch/Graver.

east-west access corridor into the project area, which undoubtedly accounts somewhat for the two broken bottle fragments found during the reconnaissance and survey of the site.

Current Work: A general reconnaissance of the site area was made by the survey team, who then conducted radials from an arbitrarily selected centerpoint. As the site is located north of 1Ma216, special care was taken to determine if the sites could be part of the same cultural entity. Although both sites, in addition to 1Ma218, are located in the same plowed field, gradual rises and swales essentially divide each of the three site areas from the other, and, in the cases of 1Ma217 and 1Ma218, a well-defined depression separates the two sites.

Current Results: The radials indicated that the site is approximately 55 meters (180.4 feet) north-south, and 30 meters (98.4 feet) east-west, though artifact occurrences along the radial lines tended to be erratic and low (Figure 90). The highest frequency recorded in any collection square was two, with one occurrence each along the north, northeast and southeast radials. No subsurface testing was conducted at the site.

No diagnostics were recovered at this site, and, therefore, a general cultural affiliation cannot be assigned. The artifactual assemblage (Table 33) included 25 prehistoric artifacts and two historic clear glass pieces. These latter artifacts are undoubtedly the result of recent deposition.

1Ma217: Archaeological Investigations

1Ma217 is situated to the western side of a large plowed field, and was first identified during the project survey of sample units within the project corridor. Separated from 1Ma217 to the northeast by a well-defined depression, the site is also separated from 1Ma216, almost directly southeast, by a gradual rise in elevation.

Current Work: The site lies on a slightly elevated rise, and is surrounded on three sides (west, north, and east) by depressed bottom-land woods. A general reconnaissance of the site area was made prior to the establishment of the arbitrary centerpoint, and indicated that overall surface artifact densities were low. The centerpoint was located in a relatively high frequency area, and the radials conducted.

Current Results: The radials indicated that the relatively high frequency area was the primary core of the site, which constituted densities of one and two artifacts per collection square, within five to fifteen meters (16.4 to 49 feet) of the centerpoint (Figure 91). The highest frequency of any collection square within the primary core area was four. The remainder of the site area displayed counts of one, though two instances of counts of two were identified along the southwestern radial. The site is oriented southwest-northeast, and

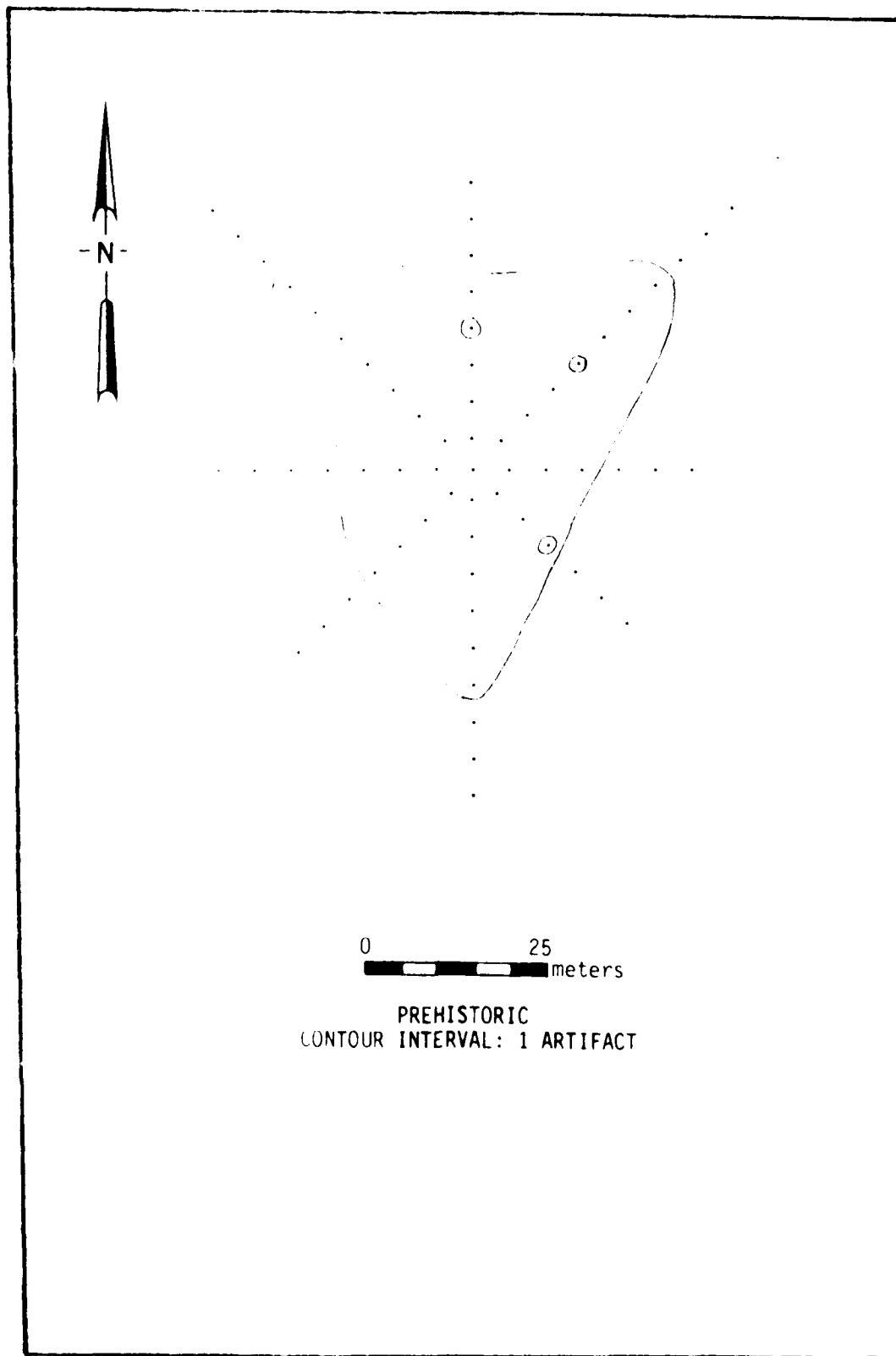


FIGURE 90. FREQUENCY CONTOUR MAP OF SITE 1Ma217 SHOWING RADIAL
TRANSECT GRID.

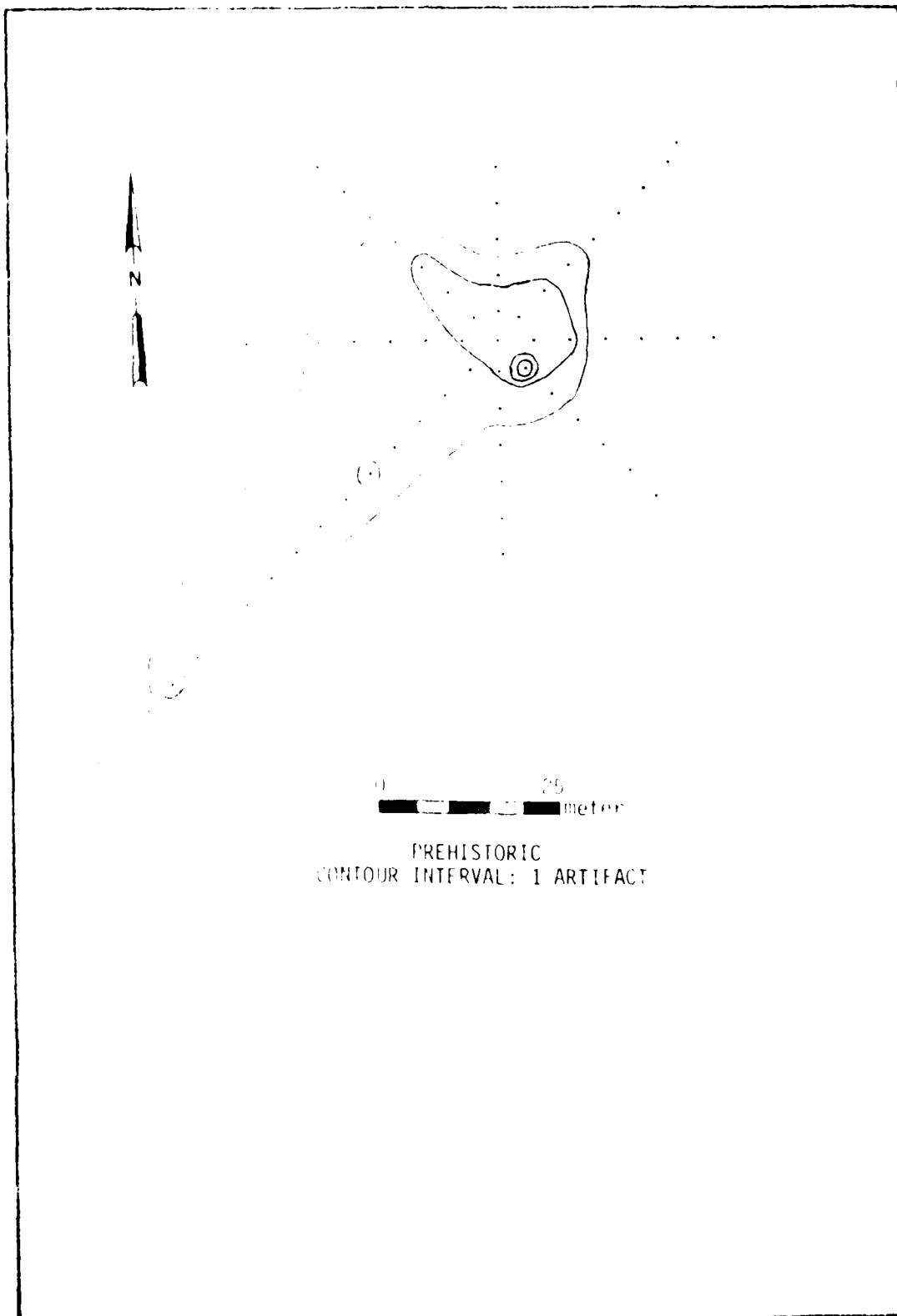


FIGURE 91. FREQUENCY CONTOUR MAP OF SITE 1Ma218 SHOWING RADIAL
TRANSECT GRID.

TABLE 33. ARTIFACTS RECOVERED FROM 1Ma217 AND 1Ma218.

	1Ma217 Surface and Radials	1Ma218 Surface and Radials
LITHICS		
Chipped stone		
Flakes, unmodified		
Primary	1	2
Secondary	1	2
Tertiary	6	5
Flake frag., unmodified		
Tertiary	3	5
Debris, unmodified	4	8
Flake fragments, modified		
Tertiary	1	1
Core, unmodified	1	1
Bifacial tools		
Spokeshave	1	
Projectile points		
Unidentified	1	
Mud Creek		1
Groundstone		
Unmod. river cobble	2	
Sm. battered cobble	2	
Pitted cobble		2
Total	23	27
PISTOLIC		
Glass		
Brid. bottles		
Clear	2	
Total	2	

the long axis is 66 meters (262.4 feet), while the maximum width of the site is approximately 25 meters (82 feet) northwest-southeast. The artifacts recovered during the general reconnaissance and radial program were primarily flakes and debris, though one pitted cobble and a Mud Creek projectile point were also found. No subsurface tests were conducted at the site.

Like the preceding site, 1Ma218 is a light lithic scatter (Table 33). The area around the site has been heavily disturbed by agricultural activity. The single Mud Creek projectile was the only diagnostic found, and, based on this specimen, a Late Archaic date is suggested for the occupation (Plate 49).

1Ma190 and 1Ma229: Introduction and Topography

Although 1Ma190 was known prior to the inauguration of this project, 1Ma229 is a newly discovered site, which was found during the course of the general reconnaissance of the 1Ma190 environs. Site 1Ma190 lies on a low knoll, which rises on the southeast side of the bottomland of the stream that originally flowed through the Boundary Canal Basin (Figure 92). A five percent slope leads from the knoll crest to the 100 meter (328 foot) - wide bottomland, approximately three meters (9.8 feet) lower in elevation. It is on the lower ridge slope to the northeast that 1Ma229 is situated (Figure 93). Ill-defined drainage swales extend northeast on both sides of the knoll, which is no more than 125 to 150 meters (410 to 492 feet) wide. A low relief surface gently rises to the northeast meeting the lower slope of Bell Hill.

Prior to historic modification of the drainage, both sites were on a low rise between two ephemeral streams, which drain part of Bell Hill and the uplands south of the Hill as far the limestone dome, south of which is 1Ma49. At the base of the knoll, the possibly seep-fed, formerly natural stream flowed northwest. A shallow, open depression at the head of the stream was four hundred meters (1,312 feet) south of 1Ma190, and approximately the same distance from 1Ma229. Local chert and sandstone were available at Bell Hill, 1.2 kilometers (.75 miles) to the northeast. Exotic cherts and other rock types could have been found 1.2 kilometers (.75 miles) to the south in Tennessee River gravels, at the degraded cutbank of the upper terrace, and in the channel of the river.

1Ma190: Archaeological Investigations

The site area is currently in cultivation, and has been impacted, not only from the agricultural activity, but also from a farm road. The proximity of the site to a principal east-west access route into Redstone Arsenal may also have allowed for uncontrolled surface collection prior to the systematic investigations conducted during the project.

Previous Work: Alexander recorded and surface inspected the site in December, 1979, and, at that time, indicated that it was a lithic scatter with minimal surface expression. He reports no diagnostics, and the general cultural affiliation is undetermined. Alexander estimates the site size to be about 75 meters (246 feet) north-south, and 25 meters (82 feet) east-west.

Current Work: As noted previously, a north-south-trending farm road bisects the site; however, it does appear to have had minimal impact on the site. Although artifactual material was identified to both sides of the road during the general reconnaissance of the site area, the majority of material lay to the west of the road. The arbitrary centerpoint was situated just to the west of the road on the crest of the small knoll. As illustrated in Figure 94, the results of

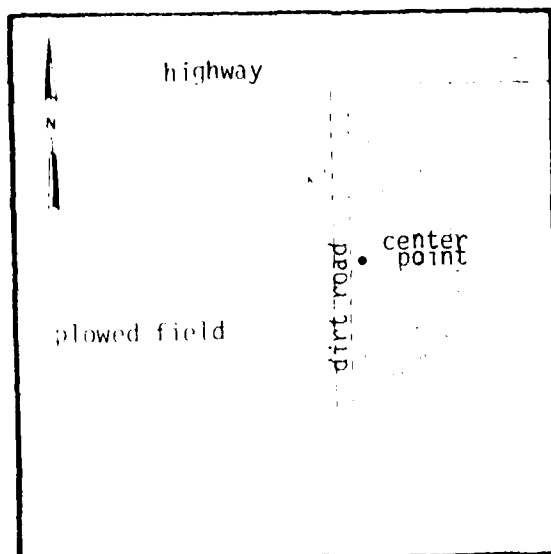


FIGURE 92. SKETCH MAP OF SITE 1Ma190.

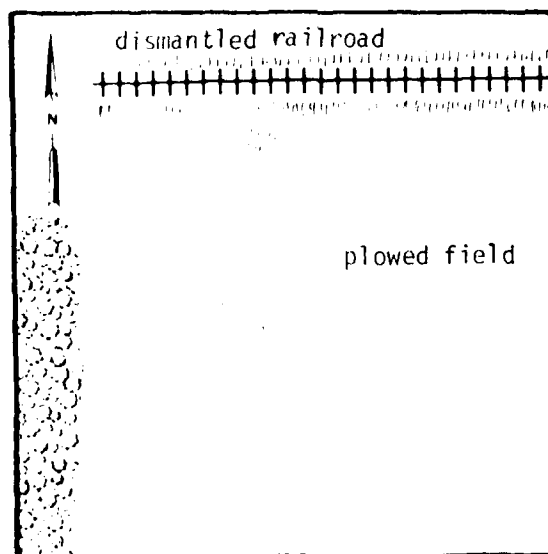


FIGURE 93. SKETCH MAP OF SITE 1Ma229.

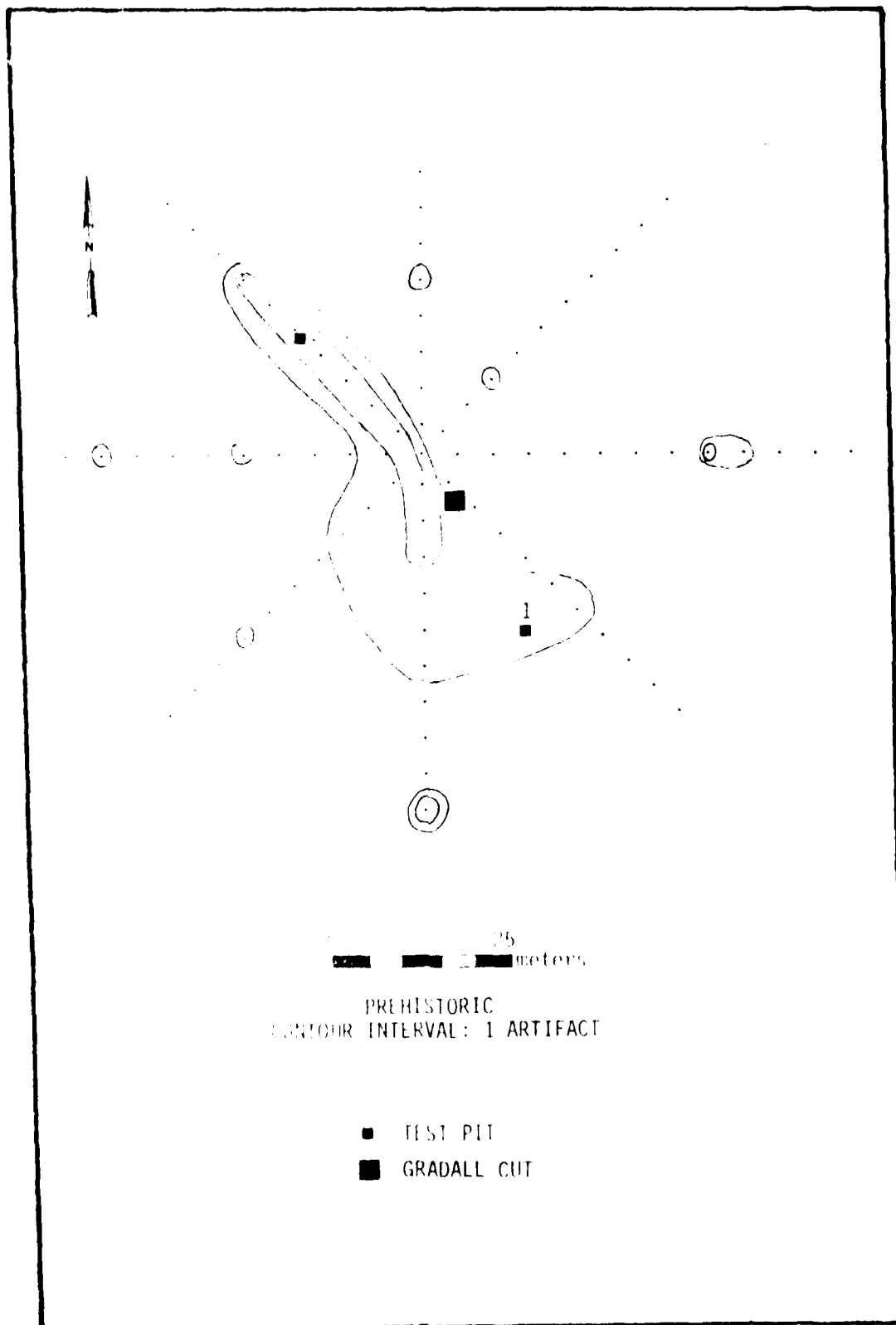


FIGURE 94. FREQUENCY CONTOUR MAP OF SITE 1Ma190 SHOWING RADIAL
TRANSECT GRID AND TEST PITS.

the radial boundary definition procedure indicate that the majority of the artifactual material conforms to the configuration of the knoll. Highest artifact densities in the collection square was two items, with a primary core area defined on the occurrence of one and two counts. The primary core area lies to the west of the farm road. During the radials and general surface reconnaissance, one piece of McKelvey Plain, three pieces of historic glass, and several examples of various flake classes, were recovered (Table 34).

The two test pits were situated on the knoll proper, and one (Test Pit 2), was placed in the primary core area. Test Pit 1, situated just west of the southeast radial line, was located to test a lower density area.

TABLE 34. ARTIFACTS RECOVERED FROM 1Ma190.

	Surface, Radials, & S. P.	T.P. 1	Totals
CERAMICS			
McKelvey Plain	1		1
LITHICS			
Chipped stone			
Flakes, unmodified			
Secondary	1		1
Tertiary	6	2	8
Flake frag., unmodified			
Secondary	6	2	8
Debris, unmodified	10		10
Flake fragments, modified			
Tertiary	1		1
Debris, modified	2		2
Core, unmodified	1		1
Core, modified	1		1
Groundstone			
Small battered cobble	1		1
Total	30	4	34
HISTORIC			
Glass			
Unid. bottle, clear	3		3
Total	3		3

Current Results: Test Pit 1 was excavated to a depth of 30 centimeters (11.8 inches) below present ground surface in three arbitrary levels. Two strata were defined. Stratum 1 is a silty clay loam, reddish-brown (2.5YR 4/4), plowzone, approximately 20 centimeters (7.9 inches) in depth. Stratum 2 is a red (2.5YR 4/6), sterile, silty clay loam plowzone. The four flakes recovered from Stratum 1 included two tertiary flakes and two secondary flake fragments.

Test Pit 2, located in the primary core area, was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below the present ground surface. Although the surface densities were relatively high in the vicinity of the pit, excavation produced no artifactual material. The stratigraphic profile was almost identical to that of Test Pit 1. Stratum 1 is a silty clay loam reddish-brown (2.5YR 4/4) plowzone, while the sub-plowzone, also a silty clay loam, is redder than 2.5YR 4/6 (red). The apparent disparity between the subsurface, though plowzone, artifact counts, and the surface manifestations, is apparently the result of the continuing cultivation of the field area.

A gradall cut was placed at the site in an effort to determine if subsurface features were present, or whether or not all cultural materials were confined to the plowzone. The cut was located to the east of the farm road, and north of Test Pit 1. Approximately five meters by six meters (16.4 feet by 19.7 feet), the cut was taken down to a depth of approximately 20 centimeters (7.9 inches). No features or hidden indications were found.

Other than one piece of McKelvey Plain, no diagnostics were recovered from this site. In general, artifactual density was quite low (Table 34), and consisted primarily of secondary and tertiary flakes and flake fragments. On the basis of the occurrence of the McKelvey Plain, a tentative assignment of Late Woodland is made for the occupation at 1Ma190.

1Ma229: Archaeological Investigations

During the course of work at 1Ma190, a general reconnaissance of the environment surrounding the site was undertaken. Approximately 145 meters (475 feet) northwest of the 1Ma190 centerpoint, a light lithic scatter was defined, essentially on a low rise of the lower ridge slope on which 1Ma190 is located.

Current Work: The site area lies in the extreme northwest corner of a plowed field, and the site's northern boundary is formed by a now-abandoned railroad cut. A series of seven transects, spaced at 15-meter (49-foot) intervals, was run north-south across the site. Each transect was approximately 50 meters (164 feet) long.

Current Results: During the course of the transects, seven artifacts were identified, including a small, battered cobble, two tertiary flake fragments, one modified secondary fragment, and one modified tertiary flake fragment, and two pieces of debris (Table 35);

TABLE 35. ARTIFACTS RECOVERED FROM 1Ma229.

	Total Surface, Radials, & S. P.
LITHICS	
Chipped stone	
Flake frag., unmodified	
Tertiary	2
Debris, unmodified	2
Flake fragments, modified	
Secondary	1
Tertiary	1
Groundstone	
Small battered cobble	1
Total	7

however, no diagnostics were recovered so it is impossible to even tentatively assign a date of occupation at 1Ma229. Although its proximity to 1Ma190 may indicate the two sites are related, we are not in a position to assess this possibility on the basis of such limited data.

1Ma210: Introduction and Topography

1Ma210 is an extensive village site, with a well-defined historic component, situated just to the east of the Redstone Arsenal Boundary. Located on a rolling upland ridge, which borders the eastern side of the only major tributary to the Boundary Canal, the site encompasses the major portion of the ridge. The tributary and its branches (artificially channeled throughout their length) drain portions of the Huntsville Spring Branch basin, and the upland ridge east of the Basin. The tributary's westernmost branch passes between bottomland rises, on which 1Ma226 and 1Ma227 are located. The neighboring branch to the east receives water from the southeastern tip of the Byrd Spring Lake bottomland. Unfortunately, this tributary system, and its relationship to the ridge on which site 1Ma210 is located, appear to be largely the product of historic human activity (see other topographic descriptions, within the Boundary Canal Basin and Adjacent Uplands physiographic zone).

The site covers part of the western crest and upper slope of the ridge. At the southern end, the ridge summit is approximately six meters (19.7 feet) above the adjacent bottomland, and, at its northern end, the elevation difference is some four meters (13.1 feet). Hillside slopes generally range between four and five per cent. A lake was present in the bottomland along the north-central portion of the ridge in 1937, and seeps were detected along the lower slopes by the archaeological survey crew during this study.

It appears that the prehistoric water sources available at the site included seeps and lakes in a restricted basin, either closed, or open to the larger basin through which the Boundary Canal now flows. The possible opening is not the swale through which the present tributary flows. Rather, it is the presently blocked swale south of the rise on High 120157 is located.

Local bent, sandstone, and shale were available on the upper slope of Hill Hill, approximately 1.5 kilometers (.9 miles) to the northeast. Gravels containing local and exotic chert and other rock fragments were present in the outbanks of the Tennessee River terraces, approximately 2.5 miles to the south.

Archaeological Investigations

The site lies within plowed fields, and partially overlaps, along its western margin, into pasture. As defined by a transect methodology, it is one of the most extensive of the sites encountered during the project.

Current work: The site had been identified, though not recorded, during one of Alexander's reconnaissance surveys of the Redstone Arsenal vicinity. During the course of this project, Alexander returned to the site with senior project personnel while defining access routes to the major known sites along the eastern boundary of the Arsenal. However, the site was not formally recorded until the survey of selected portions of the study corridor. At that time, the survey crew recorded the environmental variables concerning the site, and conducted a non-collection surface reconnaissance, in order to generally define the areal extent of the site.

The site was chosen for testing as part of the judgmentally selected group of sites on the basis, not only of artifact density, but also of range of artifact types identified during the preceding ground walk over of the site area. Included in the surficial artifact assemblage were ground stone, ceramics, lithics, and historic artifacts. It was felt that, with such high and varied artifact representation, the probability of defining subsurface features or hidden patterns was increased.

Because of the linear extent of the site, it was decided that a usual boundary determination procedure would not adequately define either the boundaries of the site or the nature of the site's organization. Therefore, as with other locations of similar configuration and artifact density, a series of linear transects was used. As illustrated in Figure 24, two roads, one east-west and the other north-south, cross and run along the site ridge. The north-south road, though not extending for the full length of the site, was used as the control axis for the transects, with the road line artificially extended with flagging tape, to cover the extreme southern and northern portions of the site. To the west of the control axis, and along the northern extension of the control axis, the ridge was in nature, and shovel pitting was instituted along each of the transects.

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CULTURAL RESOURCES INVESTIGATIONS AT REDSTONE ARSENAL, MADISON --ETC(U)

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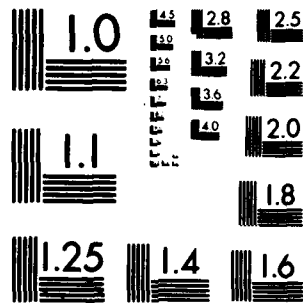
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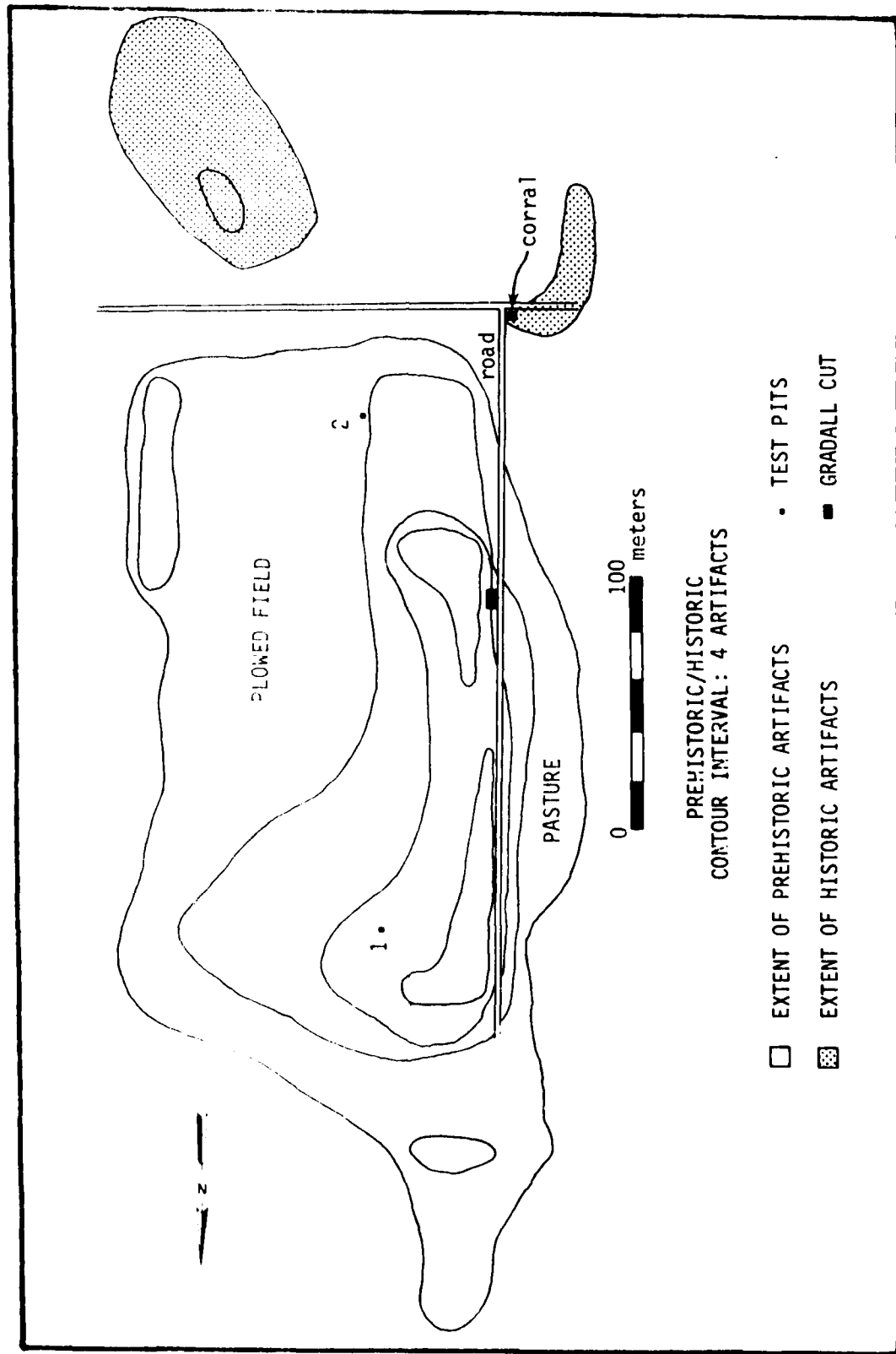


FIGURE 95. FREQUENCY CONTOUR MAP OF SITE 1Ma210 SHOWING LOCATION OF PREHISTORIC AND HISTORIC COMPONENTS, TEST PITS, AND GRADALL CUT.

A total of thirty-five linear transects, spaced at 15-meter (49 foot) intervals, was placed, running east-west across the extent of the site. Collection squares or shovel pits were conducted every five meters (16.4 feet) along each line. The results of the transect survey of the site location indicate that the historic component is confined to the southern and southwestern portions of the site, with two discrete concentrations of historic artifact material defined (Figure 95). Prehistoric artifact densities decreased gradually, moving east and west from the control axis. The two highest-density areas fell within fifty-five meters (180 feet) of the control axis, though, as indicated on Figure 95, four discrete artifact contours were developed on the basis of the artifact frequencies. Those contours indicate that the maximum width (east-west) of the site is 255 meters (836.6 feet), with the minimum east-west width (at the extreme northern edge of the ridge and site) being 35 meters (114.8 feet).

The two highest-frequency areas, situated close to the control axis on the eastern side, are of special note (Figure 95). Not only were the lithic counts high in those areas, but also the incidence of ceramics and shell was higher than in all other portions of the site. Subsequently, both Test Pit 1 and the grader cut were placed in, or adjacent to, one or the other of these high-density locations. Test Pit 2 was placed farther south, in an area of average artifact density, in order to contrast the results with those of the higher-density locations.

It should be noted that, while the test pits and grader cut were placed in high- or relatively high-density locations, there was some question, even prior to the beginning of excavation, as to how much the surface densities would correspond to subsurface manifestations. According to the landowner, the field had been recently plowed in preparation for spring planting, with plow depth averaging approximately 20 centimeters (7.9 inches). Although this resulted in ideal surface collection conditions, the possible impact in terms of subsurface integrity could not be initially evaluated.

The test pits and grader cut were placed simultaneously into the site; as noted earlier, their placement was on the basis of artifact frequency, and, in the case of the grader cut, access to the field area. All three will be discussed sequentially.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below the present ground surface. Two strata were defined. Stratum 1 encompassed all of arbitrary levels one and two, and the upper portion of three. It is a silty clay loam, dark-reddish-brown (2.5YR 3/4), plowzone. Somewhat surprisingly, artifact frequencies, even within the plowzone, were low, with a total of thirteen specimens, including one projectile point, recovered from the 24-centimeter (9.46-inch) deep zone. The underlying sub-plowzone Stratum 2 is also a dark-red (2.5YR 3/6), silty clay loam, which is totally devoid of artifactual material. The dichotomy between the artifact frequencies from the surface and those

from the test pit is not easily resolved, especially in light of the number of artifacts recovered in the excavations of Test Pit 2.

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Purposely located in an area of the site without high artifact frequency, but with consistent counts of two and three, the pit excavations revealed two distinct strata. The upper, Stratum 1, a dark-reddish-brown (5YR 3/3), silty clay loam plowzone, included few artifacts. A total of six specimens, including one ceramic, was unevenly distributed in the upper and lower portions of the stratum. The middle ten centimeters (3.28 inches) of the 26-centimeter (10.2-inch) deep zone were devoid of artifactual material. Underlying the plowzone is a sterile, 2.5YR 4/4, silty clay loam zone, designated Stratum 2. In both test pits, the sterile, sub-plowzone strata were shovel-stripped, in order to determine the presence of intrusive features. None were identified.

However, the grader-stripping of a larger area of the site did reveal the presence of four features and 37 postmold-size stains (Figures 95 and 96; Plates 68 and 69). The grader cut, as noted previously, was placed judgmentally in an area of high ceramic frequencies. The cut was made under the supervision of senior project personnel, who examined the backfill and the cut area during the course of plowzone removal for artifacts, charcoal, and evidence of features.

Approximately 25 centimeters (9.85 inches) of plowzone were removed, and the cut then stripped by shovel and trowel to give definition to the obvious features. Each feature and postmold was individually flagged and mapped with transit and stadia rod, and measurements of surficial diameter taken on each feature and postmold. The three features were sectioned, as were each of the possible postmolds (Plates 70 and 71). Half of the fill from each feature was bagged for flotation and profiled, with the remainder being excavated and hand-sorted. Approximately half of each postmold fill was also bagged for flotation, and the remainder hand-sorted. It should be noted that, during this process, four of the postmolds were determined to be either root molds or rodent burrows, reducing the number of postmolds to 33.

Feature 1 is located in the northeastern portion of the grader cut. It was identified, initially, as a circular stain. The south-west one-half of the unit was excavated, and all fill bagged for flotation (Plate 70). It was apparent, following the removal of the first half of the fill from the feature, that another, intrusive, feature was present, slightly offset south of the feature centerpoint (Figure 97). Designated Feature 4, the feature is 26 centimeters (10.2 inches) in diameter, and may be an intrusive postmold. The flotation samples removed from the first half of the overall feature would then have included mixed fill from both Features 1 and 4. In an effort to allow for discrimination in terms of fill material during later analysis, Feature 4 was cored, and the remaining fill bagged for

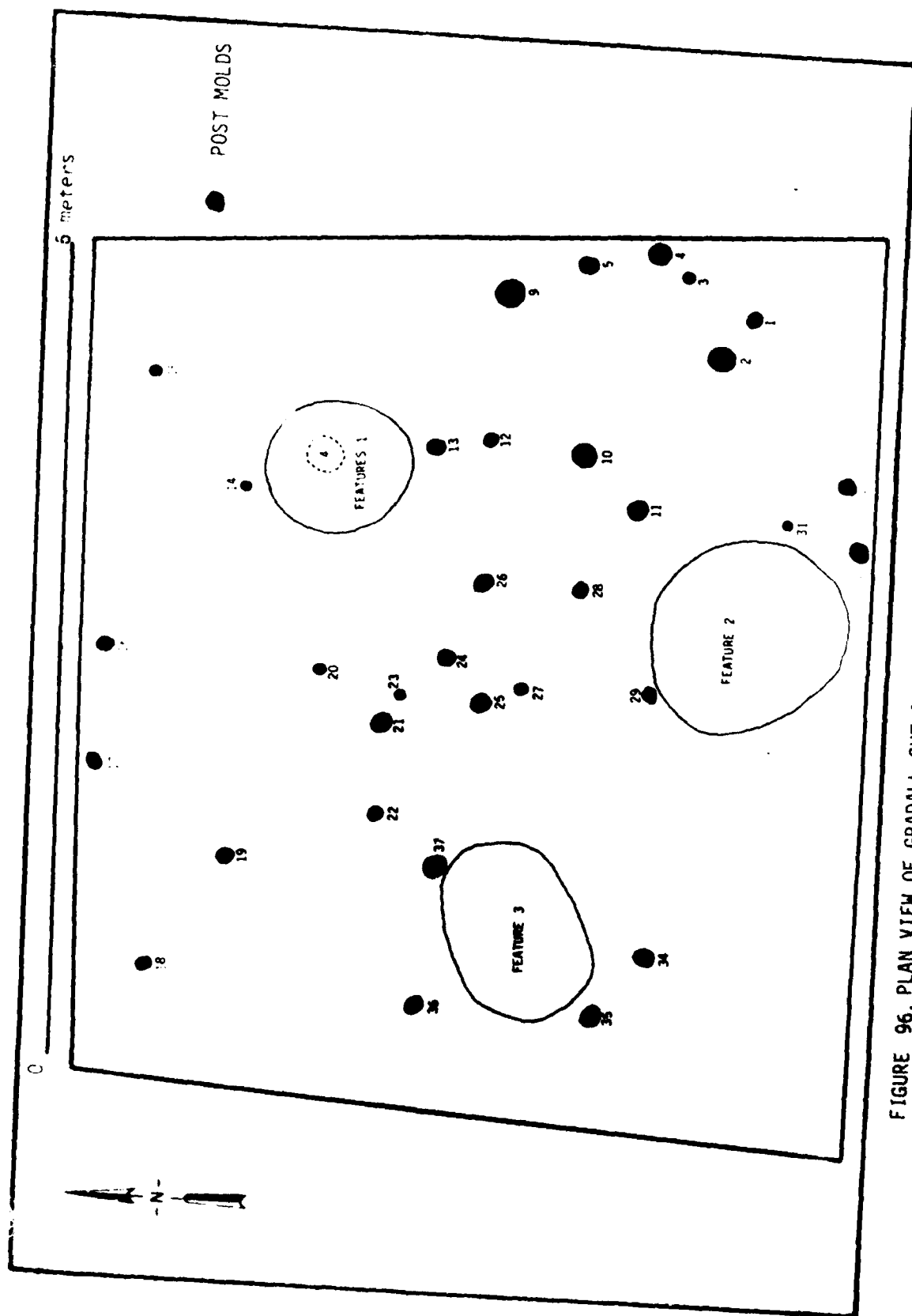


FIGURE 96. PLAN VIEW OF GRADALL CUT AT SITE 1Ma210 SHOWING LOCATION OF POST MOLDS AND FEATURES.

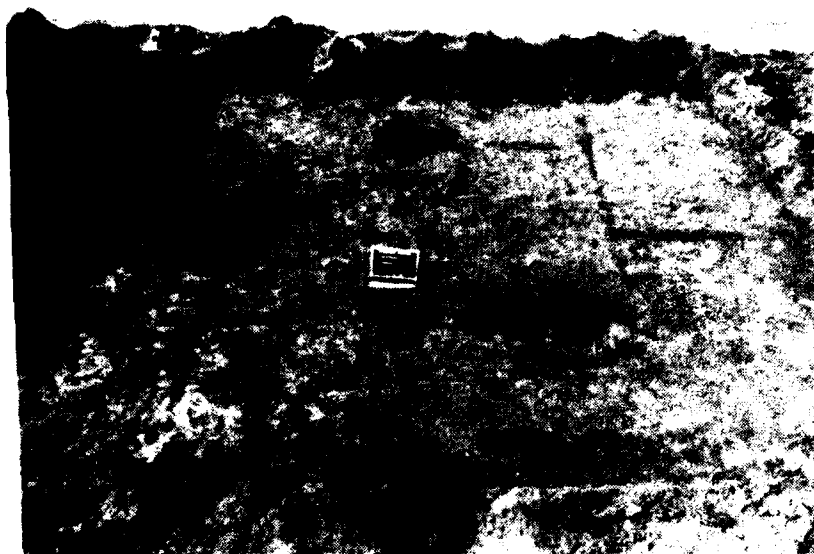


PLATE 68. 1MA210 DETAIL OF THE GRADALL CUT PRIOR TO EXCAVATION. VIEW LOOKING WEST, THE DARKER STAIN IN THE LOWER RIGHT IS FEATURE 1 AND 4.

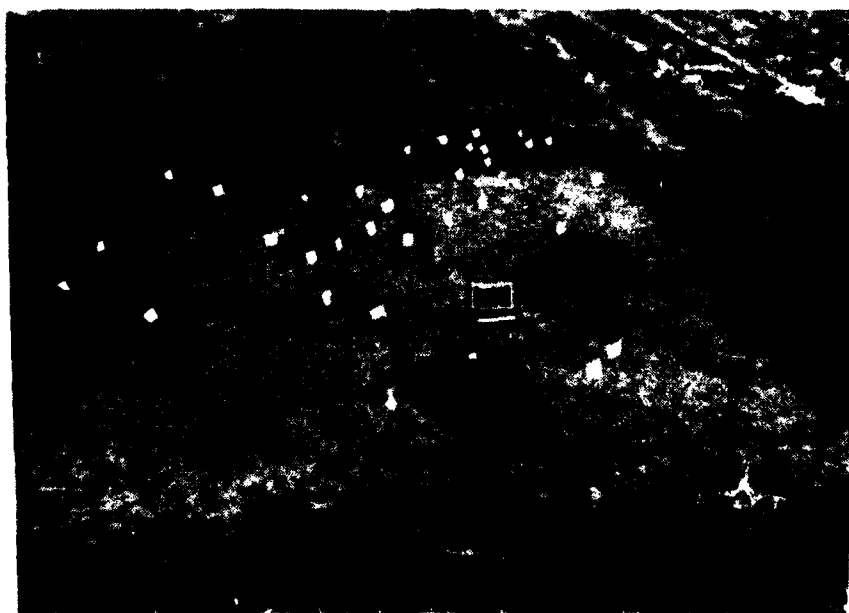


PLATE 69. 1MA210 DETAIL OF THE GRADALL CUT PRIOR TO EXCAVATION, BUT FOLLOWING THE DEFINITION OF THE POSTHOLD (MARKED WITH THE FLAGS). VIEW LOOKING EAST WITH THE DARK STAIN IN THE RIGHT CENTER FOREGROUND FEATURE 3.



PLATE 70. 1MA210 FEATURES 1 AND 4 FOLLOWING THE SECTIONING OF THE STAIN. FEATURE 4 IS THE DARKER CIRCLE ON WHICH THE MUGBOARD IS POSITIONED.



PLATE 71. 1MA210 FEATURE 2 FOLLOWING THE INITIAL SECTIONING. IT WAS LATER DETERMINED THAT ONLY 1/3 OF THE FEATURE HAD BEEN EXCAVATED DURING THE FIRST SECTIONING.

LEGEND FOR FIGURE 97

FEATURE 1

Dark Reddish Brown, 5 Yr 3/3, Silty Clay Loam with
Chert, Limestone, Shell, and Bone.

FEATURE 4

Dark Brown, 7.5 YR 3/2, Silty Clay Loam

FEATURE 2

Dark Yellowish Brown, 10 YR 3/4, Silty Clay Loam with
Chert, Limestone, Shell, Bone, and Ceramics

FEATURE 3a

Dark Reddish Brown, 5 YR 3/4, Silty Clay Loam
with Chert, Limestone, Bone, Shell, and Ceramics

FEATURE 3b

Dark Brown, 10 YR 3/3, Silty Clay Loam with Chert
Limestone, Bone, Shell, and Ceramics

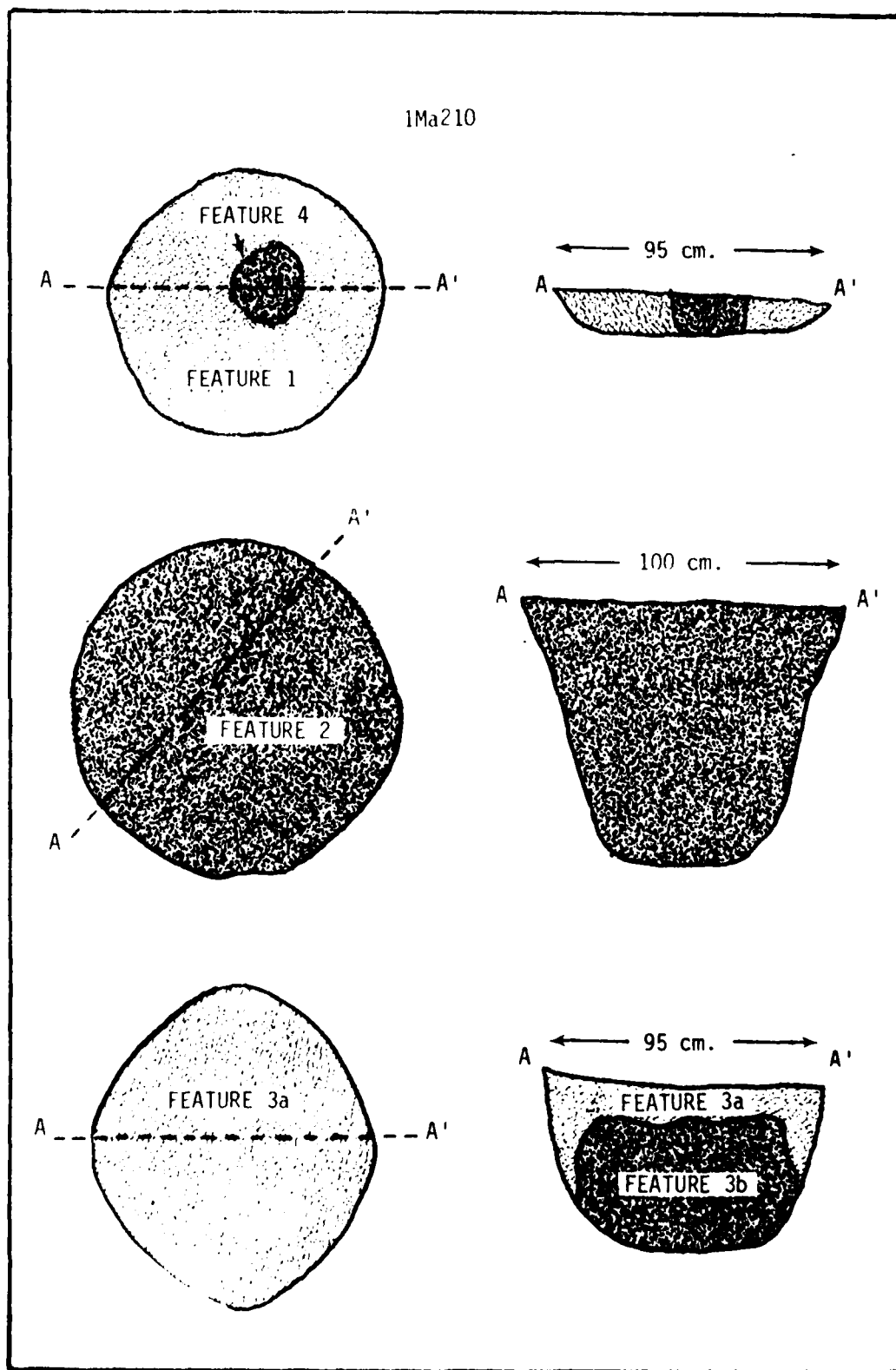


FIGURE 97. PLAN AND PROFILE VIEWS OF FEATURES 1, 2, 3, AND 4 AT SITE 1Ma210.

flotation. Following the coring procedure, the remaining northeast half of Feature 1 was resectioned, approximately 20 centimeters (7.9 inches) to the northeast of Feature 4, and the remaining fill of Feature 1 bagged for flotation. In the course of excavation, lithics, limestone pieces, bone, shell, and some ceramics were recovered, primarily from the Feature 1 fill. The diameter of Feature 1 following the completion of fill removal was 90 centimeters (35.4 inches), with a maximum depth of approximately 16 centimeters (6.3 inches). Feature 1 could be differentiated from Feature 4 on the basis of soil color, with the Feature 1 fill being a 5YR 3/3 dark-reddish-brown, and the Feature 4 fill a 7.5YR 3/2 dark-brown.

Feature 2 is situated in the south-central area of the grader cut, and is the deepest of the four features. It also appears to be the only one of the features intentionally, or specifically, used for garbage disposal. Prior to excavation, the circular stain indicating the feature appeared to be approximately 70 centimeters (27.6 inches) in diameter, and, in the initial profiling, was halved with the southwestern one-half of the feature designated for removal in toto for later flotation (Plate 71). The removal of the fill from the southwestern "half" indicated, however, that the bottom of the feature had not been reached, even though some 78 centimeters (30.7 inches) of fill had been removed (Figure 97). It was apparent, then, that the curvature of the feature was more gradual than had been anticipated. The profile which resulted from the removal of what later was determined to be the southwest one-quarter revealed no stratigraphic differentiation within the pit fill, nor were any intrusions apparent. Fill material contained lithics, shell, snail shell, burned bone and worked bone, limestone, and several ceramics, the latter including an intact vessel base. The remaining three-quarters of the pit were removed, using standard excavation techniques. The total excavation of the feature revealed that the feature shape is an inverted bell, which attains a maximum depth below old occupation surface of 88 centimeters (34.7 inches), with a diameter of 1.10 meters (3.6 feet). Fill color was a dark-yellowish-brown (10YR 3/4), which contained occasional red clay speckling and charcoal flecking. There was no indication from an examination of the feature walls that the pit had ever been fired, and it had been excavated into sterile soil.

Feature 3 was originally defined on the basis of a somewhat elongated oval stain, located in the western half of the grader cut. As with the other features, Feature 3 was halved, with one half removed intact for flotation (Plate 72). The exposed profile indicated that two distinct strata were present in the feature (Figure 97). Stratum 1 is an upper, and partially encircling, dark-reddish-brown (5YR 3/4) layer of garbage fill, intermixed with silty clay loam matrix. As can be noted on Figure 97, Stratum 1 does not completely encompass Stratum 2, but its presence to both sides of the second stratum would seem to indicate deposition following the primary use of the feature, either as a cooking pit or as a more generalized fire pit. Stratum 2 is a much more ashy, garbage-fill zone, a dark brown (10YR 3/3) in color. During the course of excavation, the Stratum 2

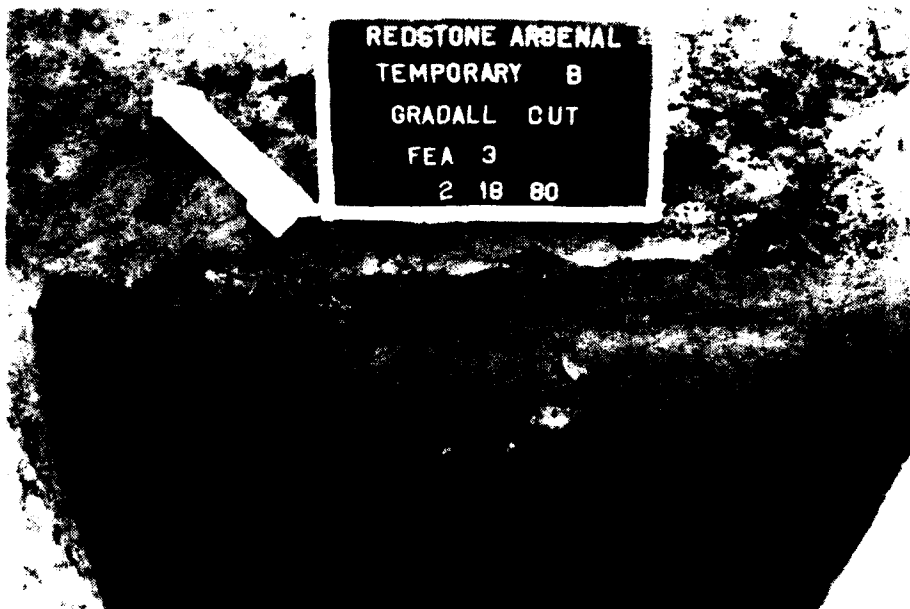


PLATE 72. 1MA210 FEATURE 3 FOLLOWING THE INITIAL SECTIONING.
THE LIGHTER STAIN APPEARS TO BE RESIDUE OF COOKING
WHILE THE DARKER FILL IS THE MORE TYPICAL REFUSE FILL.



PLATE 73. 1MA210 GRADALL CUT FOLLOWING THE EXCAVATION OF ALL
FEATURES AND POSTMOLDS. VIEW LOOKING EAST.

matrix was significantly "greasier" to the touch, and greater amounts of bone and shell than the overlying and encircling Stratum 1 were noted. It would appear that the feature was initially used as a fire-pit (cooking pit), and then, subsequently, filled with refuse, sometime following the compaction of the cooking-pit residue.

In addition to the three features, thirty-three postmolds were defined in the grader cut (Plate 73). Although it is not possible to say with certainty that a specific number of structures was present, the size of the grader cut alone obviates the possible completion of any given pattern, considering the typical size of Middle Woodland structures (Faulkner and McCollough 1973). One definite pattern is apparent from the placement of posts in close proximity to the features (Table 36); in the case of each feature, a set of two postmolds is present, one on each end of the long axis of the feature. The following summarizes the probable combinations:

TABLE 36. POSTMOLD SETS IN RELATION TO FEATURES

<u>Feature Number</u>	<u>First Set</u>	<u>Second Set</u>
Feature 3	Postmolds 35, 37	Postmolds 34, 37
Feature 2	Postmolds 30, 29	N/A
Feature 1	Postmolds 13, 14	N/A

As only Feature 3 indicates any evidence of possible cooking having been conducted within it, the association of the postmolds with Features 1 and 2 may be somewhat fortuitous, although it is our feeling that the pits may have been partially enclosed, even if their primary function was for garbage disposal.

The results of both the pollen and ethnobotanical analyses are presented on Table 37. In addition, on Table 38 reconstructed length by width measurements of *Helianthus annuus* achenes are listed. A comparison of the materials recovered principally from other reported Middle Woodland sites (Cobb and Shea 1977; Schroedl 1978) would appear to indicate a close similarity in species exploited. The identification of sunflower from 1Ma210 is of special interest in light of the results reported by Cobb and Shea (1977). Their work with the ethnobotanical remains from the Middle Woodland component at the Owl Hollow Site (40Br7) identified mean length by width achene measurements of 35.5 mm, a marked increase in size over examples reported from Archaic or even Early Woodland contexts. Their conclusion was that by Middle Woodland time, sunflower was at the very least semi-domesticated, if not wholly so. The mean measurement of the 1Ma210 examples, 43.9 mm, would reinforce that conclusion, and indicate that by Middle Woodland times semi- or completely domesticated sunflower was being utilized as an integral part of a subsistence pattern which also relied heavily upon wild or other semi-domesticated plant species.

TABLE 37. 1Ma210, SEEDS AND FRUITS IDENTIFIED.

SPECIES	PROVENIENCE										
	1&4	1	1 (sw)	2	2 (sw)	3 (sw)	3L-1	3L-1 (sw)	3L-2	3L1&2	3L1&3
<u>Amaranthus</u> sp.									3w		1w
<u>Chenopodium</u> sp.	4w	10w	5w	65w	3w	6w	17w	7w	65w	30w	11w
<u>Dracaena</u> sp.				1w							
<u>Cucurbita pepo</u>			1f								
<u>Diospyros virginiana</u>									2w, 2f		
<u>Eubaceae</u>			2w	15w	2w	1w	1w		6w		1w, 1
<u>Galium</u> sp.	2w										
<u>Gleditsia triacanthos</u>		3f							2w		
<u>Helianthus annuus</u>				4w, 2f	1w				4f		
<u>Lagenaria siceraria</u>											2
<u>Phalaris caroliniana</u>	15w	30w	17w	73w	16w	1w	50w	14w	105w	64w	5w
<u>Phytolacca americana</u>								1w			
<u>Rnaceae</u>		1w	1w, 1f	2w					1w		
<u>Polygonum</u> sp.				1w					7w		
<u>Portulaca oleracea</u>				5w				5w	20w	3w	
<u>Rhus</u> sp.				1w							
<u>Rubus</u> sp.									1w		
<u>Viburnum prunifolium</u>		1w									
<u>Vitis</u> sp.		1w			1w				1w	1w	
Unknown			2w	3w, 3f	1w				1w		
TOTAL	21w	43w, 3f	27w, 2f	169w, 5f	24w	8w	68w	27w	214w, 6f	98w	18w, 1

37. 1Ma210, SEEDS AND FRUITS IDENTIFIED.

PROVENIENCE

Features								Postmolds						TOTAL
2 (sw)	3 (sw)	3L-1	3L-1 (sw)	3L-2	5, 5A2	3L1&2	4	10	11	31	32	36	37	
3w	6w	17w	7w	3w 65w	50w	1w 11w	2w, 2f	1w, 1f	1w					4w 229w, 3f 1w 1f 2w, 2f 29w, 1f 2w 5w, 6f 2f
2w	1w	1w		2w, 2f 6w		1w, 1f								
1w				2w 4f										
15w	1w	50w	14w 1w	105w 1w 7w 5w 20w 1w	54w 3w	5w 2f		1w	1w					395w 1w 5w, 1f 8w 33w 1w 1w 1w 4w 7w, 3f
1w 1w				1w 1w	1w									
24w	8w	68w	27w	214w, 6f	98w	18w, 1f	2w, 4f	2w, 1f	1w	1w	4w	1w	1w	726w, 20f

2

Table 38. 1Ma210, Reconstructed Length x Width Measurements (mm) of Sunflower Achenes.

Feature	Length x Width
2	(1)9.9 x 6.3
	(2)6.5 x 3.6
	(3)8.4 x 4.9
	(4)9.6 x 5.6

Size Range:

Length 9.9-6.5

Width 6.3-5.6

Mean L X W = 8.6 X 5.1 = 43.9

2(sw) (1)8.4 x 3.8 = 31.9

In sum, the features and postmolds delineated in the grader cut would indicate several periods of utilization of the area, all within the Middle Woodland period. This assignation is further confirmed by the artifacts (Table 39) recovered during the course of both the site delineation and the excavations (Plates 74, 75, 76 and 77). In addition to the Middle Woodland period occupation of the site area, a well-defined Historic component is present at the southern end of the site. However, due to the agricultural use of the site area, no evidence of associated historic structures or features remains. This historic component was marked by an appreciable quantity of artifacts (Table 39), all of which appear to date prior to World War II (Plate 78).

1Ma157: Introduction and Topography

1Ma157 covers a ridge crest and upper slope which face west, overlooking the Boundary Canal bottomland. Maximum elevational difference between the crest and the adjacent bottomland is approximately six meters (19.6 feet). Between the broad upper slope and the bottomland, the hillside slope is approximately 5 percent.

In an effort to define the stratigraphic sequence of the site location, a series of backhoe trenches was placed in the vicinity of the crest, ridge, and slope. Backhoe Trench I 25-4 at the south end of the site ridge encountered a 30-centimeter (11.9-inch) -thick layer of old colluvium, above an older soil containing angular, secondary chert, occurring in increasing abundance downward. The older soil developed in material weathered in situ from limestone bedrock. Trench I 25-5, at the transition between the hillside and the bottomland, at the northern end of the ridge, exposed a section of more than 1.3 meters (4.3 feet) of alluvial clay, below some 17 centimeters or 6.7 inches of more recent colluvium. The form of this hill was probably relatively stable during prehistoric times, and seems not to have changed greatly in historic time. Some loss of surface soil (perhaps 20 centimeters or 7.9 inches), according to estimates in Swenson et al. (1958), is possible, and is probably the result of cultivation.

Perennial water supplies were available in the bottomland at the base of the ridge. Ponds, swamps, or a stream flowing north, were probably present at various times during the past twelve to fifteen thousand years, as the swale floor was possibly two meters (6.6 feet) or more lower during the late Wisconsinan glaciation (Chapter 6). Sources of local chert, sandstone, and shale were the upper slopes of Bell Hill, approximately 1.5 kilometers (.9 miles) to the southeast. Local and exotic chert, and other resistant rock types, were available in gravels of the Tennessee River terraces, 3.5 kilometers (2.2 miles) south of the site, across rolling uplands.

TABLE 39A. ARTIFACTS RECOVERED FROM 1Ma210.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Fea. 1	Fea. 2	Fea. 3	Fea. 4	Fea. 1 and 4 Mixed	Postmold	Surface Gradall Cut	Totals
CERAMICS											
Mulberry Creek plain	183		1	57	211	322	5	3	13		795
Mulberry Creek plain (smooth)						125	5	3			133
Mulberry Creek plain (rough)						6	3	5			14
Pickwick Compl. stamped	1					1					1
Flint River brushed						2					3
Flint River cordmarked	8			1	6	2					15
Bluff Creek simple-stamped				1		2	1				4
Clay Reed impression						1					1
Sauty incised				1							1
BURNED CLAY											
	4				9	27					40
LITHICS											
Chipped stone	5										5
Primary form											
Flakes, unmodified											
Primary	56			3	10	23	1	4	1		98
Secondary	122			1	19	39	2	4	1		188
Tertiary	549		3	27	47	160	1	24	11		822
Flake frag., unmodified											
Primary	23			3	13	12		1	2		54
Secondary	51			2	11	22			2		90
Tertiary	539		2	1	80	124		6	1		771
Debris, unmodified	323		1	7	32	51		11	2		428
Flakes, modified											
Primary	1										1
Secondary	8										8
Tertiary	17										17
Flake fragments, modified											
Primary	2										2
Tertiary	10										10
Debris, modified	12										12
Core, unmodified	93			3	9	4		2			112
Core, modified	4								1		5
Blade	10										10
Unifacial tools											
Domed scraper/chopper	3										3
End scraper on flake	2										2
Side scraper	4										4
Notched flake	1										1
Spokeshave/graver	1										1
Graver	5										5
Spokeshave	3										3
Unid. fragment	1										1
Bifacial tools											
Knife	4										4
Graver	1										1
Small flat ovate	2										2
Preform	6										6
Unid. frag., no apparent usage	10										10
Unid. frag. w/scraping use	13										13
Drill	3										3
Punch/graver	3										3
Ovate to elongated	3										3
Knife fragment	5										5
Unid. w/heavier use than TiO	2										2

TABLE 39B. ARTIFACTS RECOVERED FROM 1Ma210 (Cont'd)

Surface, Radials, & S. P.	T.P. 1	T.P. 2	Fea. 1	Fea. 2	Fea. 3	Fea. 4	Fea. 1 and 4 Mixed	Postmold	Surface Gradall Cut	Totals
HISTORIC										
Glass										
Medicine bottles, post-1920	1									1
Blue	1									1
Liquor, post-1932										
Brown	1									1
Jars, other										
Aqua	3									3
Soft drink	6									6
Unid. vials	1									1
Unid. bottles										
Aqua	8									8
Clear	24									24
Brown	6									6
Amethyst	6									6
Green	4									4
Pane glass	4									4
Ceramics										
Ironstone										
Undec.	12									12
Scalloped	1									1
Polychrome	1									1
Floral dec. brown	1									1
Blue-rimmed	1									1
Porcelain										
Undec.	4									4
Blue	3									3
Stoneware										
Blue	1									1
Lead glaze	5									5
Rockingham glaze	2									2
Metal										
Disk	2									2
Plow element	1									1
Hatchet fragment	1									1
Unid.	1									1
Total	101									101
BONE										
Deer (not burned)	4	1		3	6					14
Deer (burned)				3						3
Bird turkey	1*	1*		3**	2					9
Med/lg mamma (not burned)	13	6		19	11	1				50
Med/lg mamma (burned)		3		10	28					41
Tool(?)					1					1
Unid. (not burned)				14	21	3	7	1	4	43
Unid. (burned)	22			35	63	4	5	3		134
Gar fragments(?)					3					3
Raccoon										
Total	40	11		89	135	8	12	4	4	303

* burned
** 2 burned

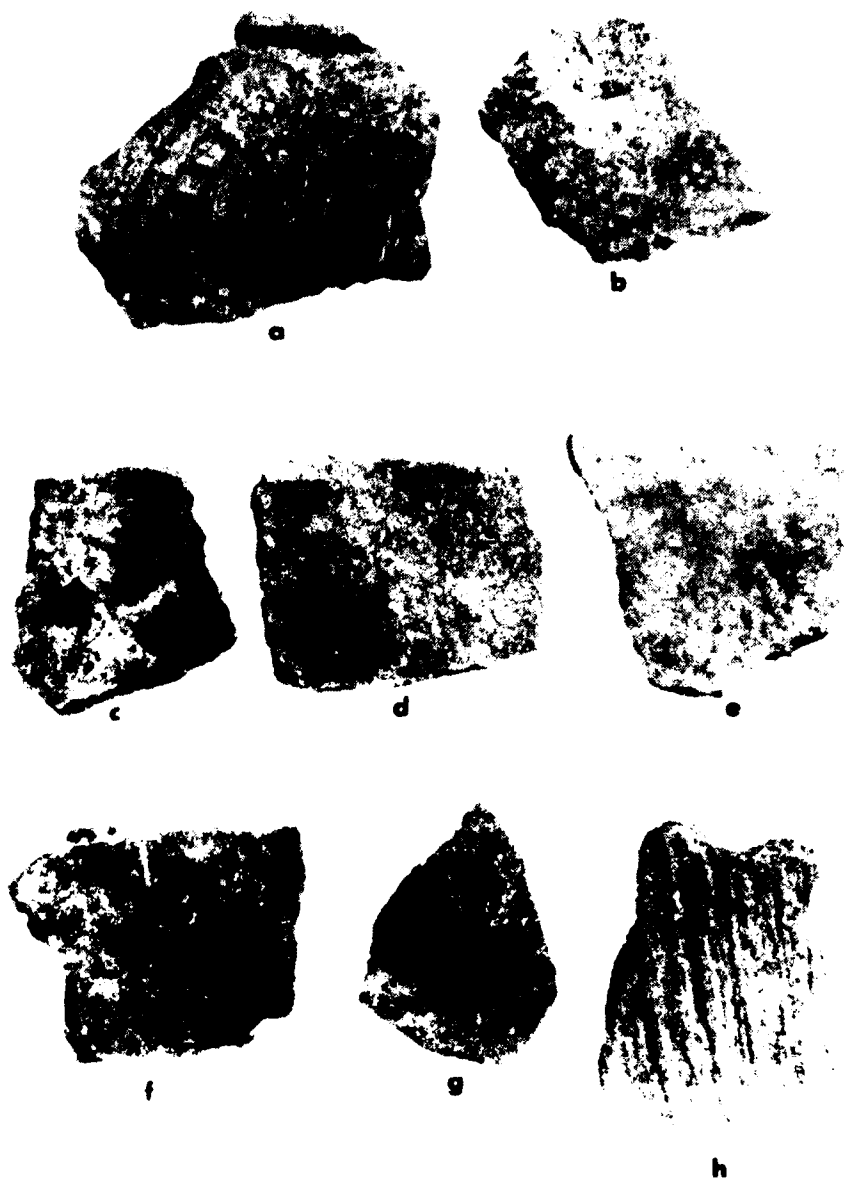


PLATE 74 PREHISTORIC CERAMICS FROM 1Ma210.
 a, Bluff Creek Simple Stamped (Pickwick Complicated ?);
 b-e, Mulberry Creek Plain rims; f and g, Mulberry Creek
 Plain, smoothed; h, Mulberry Creek Plain, brushed.

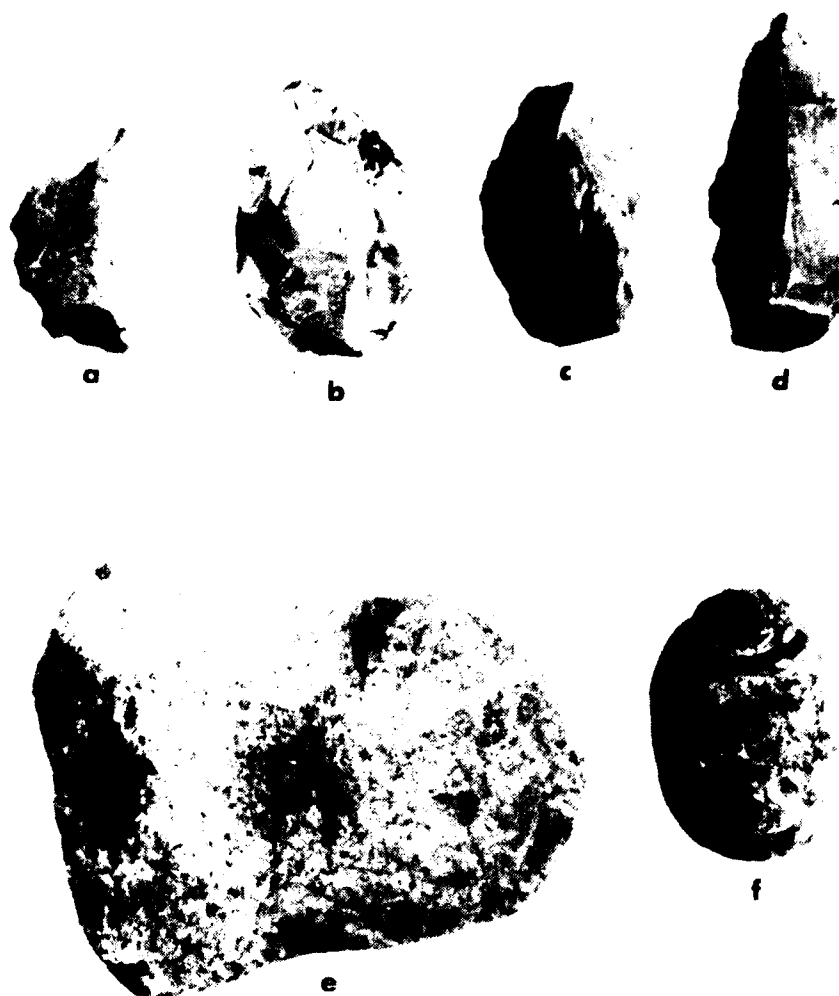


PLATE 75. LITHIC ARTIFACTS FROM 1Ma210.
 a, Unifacial Spokeshave and Graver; b and c, Bifacial
 Preforms; d, Bifacial Backed Side Scraper; e, Battered
 Pitted Cobble; f, Plummets

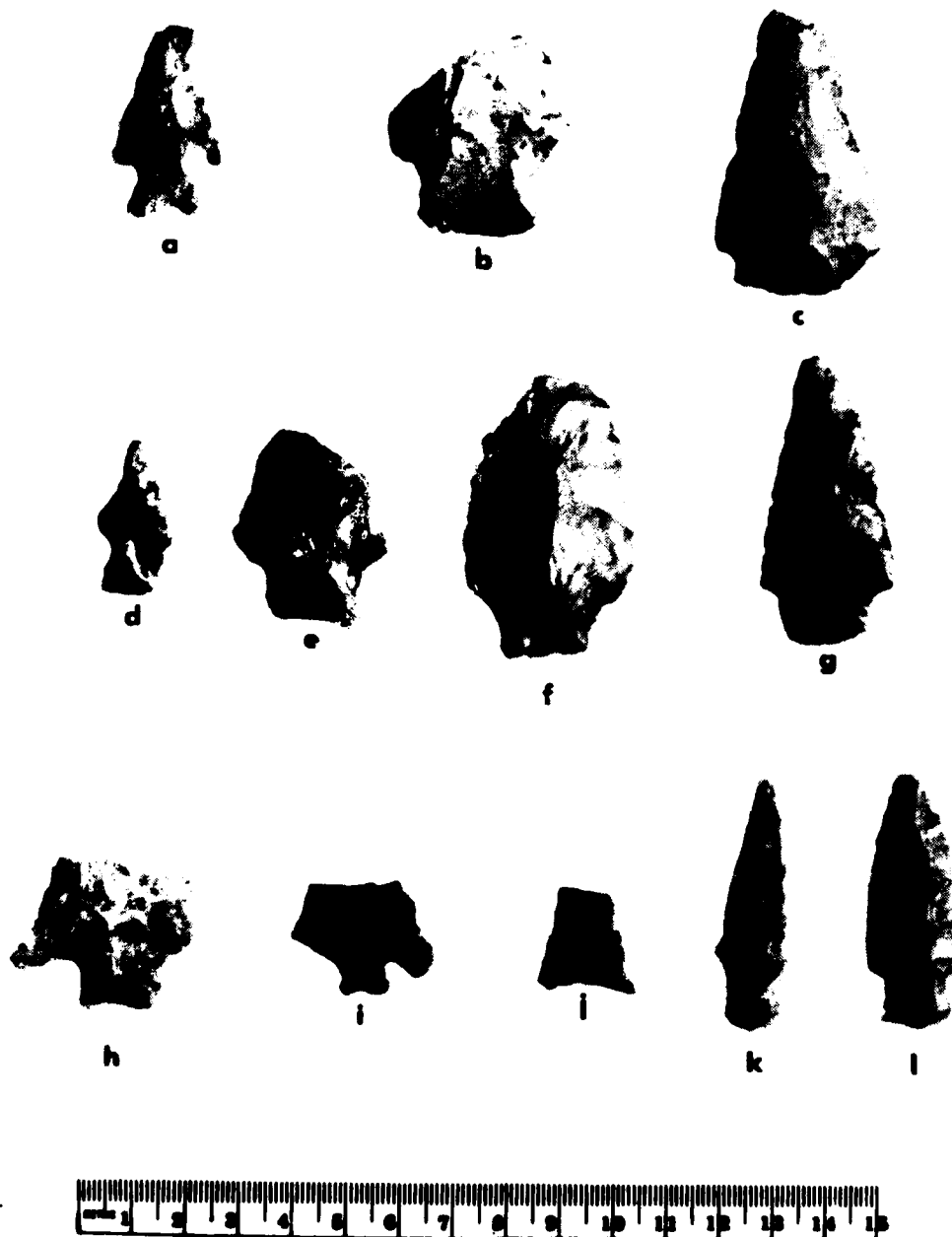


PLATE 76. PROJECTILE POINTS FROM 1Ma210.
 a, Stanley; b, Lange-like; c, White Springs; d, Swan
 Lake; e, Type 101; f and g, Morhiss variant; h and i,
 Wade; j, Hamilton; k, New Market; l, Mountain Fork.

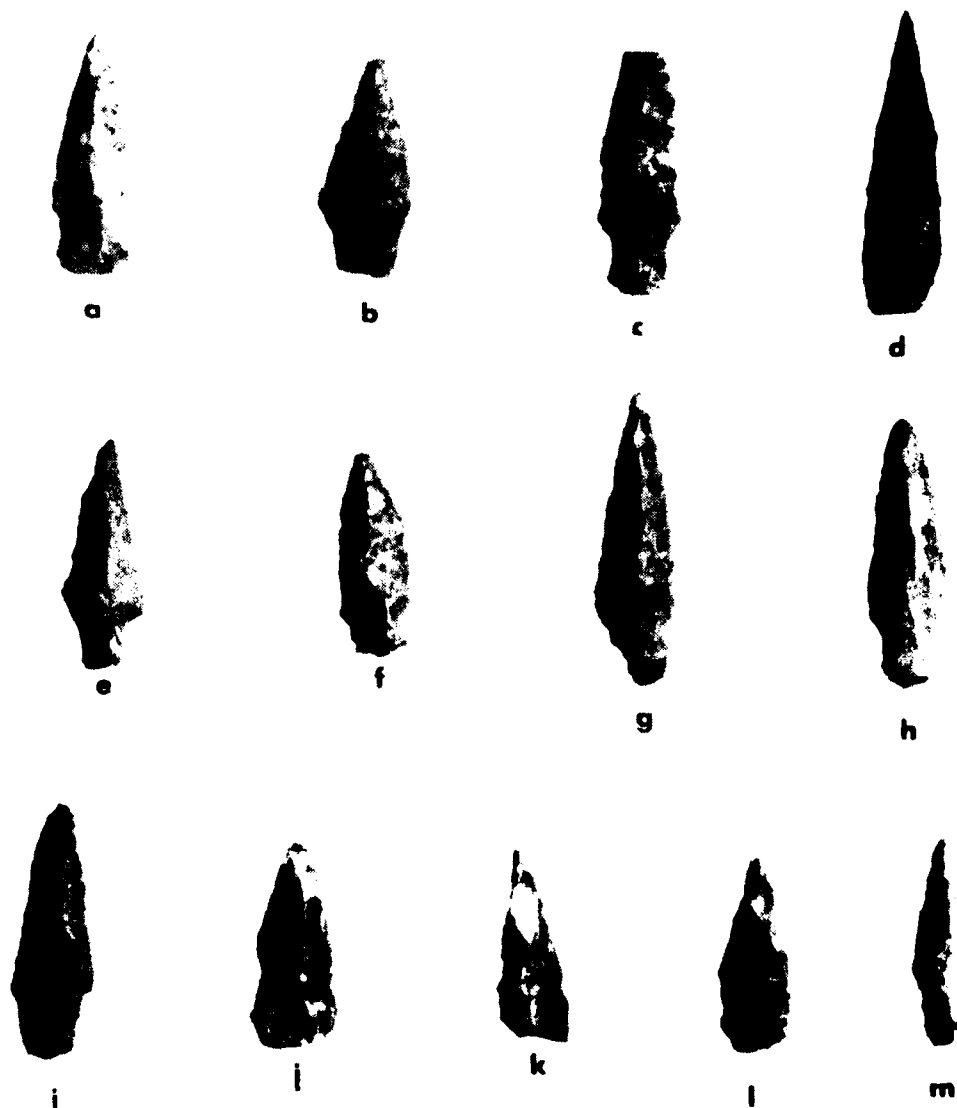


PLATE 77. PROJECTILE POINTS FROM 1Ma210.
a-m Bradley Spikes.



PLATE 78. HISTORIC ARTIFACTS FROM 1Ma210.

a, Ironstone fragment, blue rimmed; b, Ironstone fragment, brown floral decoration; c, and d, Porcelain fragment, blue transfer printed; e, Stoneware fragment, Rochingham ware; f, Liquor bottle base, automatic manufacture; g, unidentified Iron disk; h, Iron Hatchett fragment.

1Ma157: Archaeological Investigations

One-half of 1Ma157 is currently in pasture grass, while the remainder is a plowed field (Figure 98). The middle portion of the site is bisected by a farm road. Although land modifications initially appeared to have had minimal impact on the integrity of the site, the results of the testing program were negligible indicating impact may have been greater than that observed.

Previous Work: The site was originally found and recorded by Alexander (1979:129-130) during the 1978 reconnaissance of selected portions of the Redstone Arsenal area. At the time of the survey, Alexander reported the site as being 75 meters (246 feet) north-south, and 30 to 40 meters (98 to 131 feet) east-west, with all identified cultural material confined to the plowzone. Sheet erosion, apparently, had also scattered artifactual material downslope to the

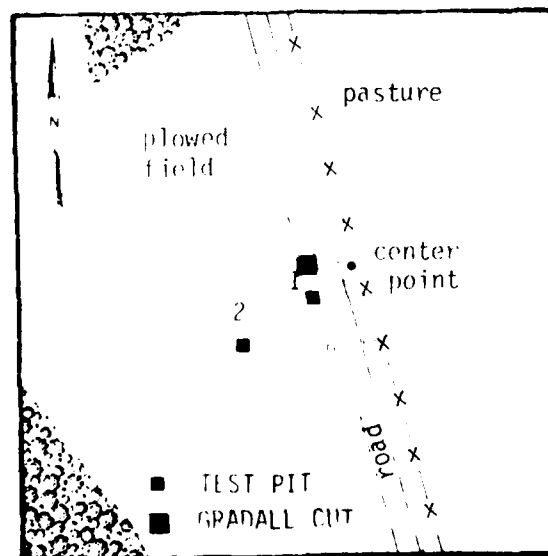


FIGURE 98. SKETCH MAP OF SITE 1MA157.

west of the site. In addition to surface observation and collection, Alexander conducted a limited subsurface shovel-testing program. In total, twelve artifacts were recovered, including one Alba projectile point. On the basis of the low artifact frequencies, the site was classified as a minimal lithic scatter, and chronologically placed, because of the Alba point, in a general Archaic context.

Current Work: A general surface reconnaissance of the site area revealed no surface artifactual material, therefore, the centerpoint

was located on a high point of the ridge crest. A modified radial procedure was conducted. Because approximately half of the site is in pasture, shovel tests were substituted for collection squares along the north, northeast, east, and southeast radials, while the remaining radials, in a plowed field, were visually inspected every five meters (16.4 feet) along the radial lines. No artifactual material was recovered. In addition, a series of seven transects, spaced at 15-meter (49-foot) intervals was run northwest-southeast in the plowed-field half of the site. Again, no surface artifacts were observed.

The dearth of surface indications of cultural activity obviated utilizing the normal artifact density contours to aid in the placement of the test units. The units were, therefore, placed judgmentally, one on the rise crest and the other downslope, along the western edge of the site. The placement of the latter unit was partially predicated on Alexander's statement that downslope erosion was resulting in artifact displacement along the western section of the site.

Current Results: Test Pit 1 was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface. Two distinct strata were identified. Stratum 1 is a silty loam, dark-reddish-brown (2.5YR 3/4) plowzone, averaging 16 centimeters (6.3 inches) in depth. One secondary flake fragment was recovered from the stratum (Table 40). Stratum 2 is a sub-plowzone, silty clay loam, slightly redder than dark red (2.5YR 3/6). It was sterile of artifactual material.

TABLE 40. ARTIFACTS RECOVERED FROM 1Ma157.

	T.P. 1	T.P. 2	Totals
LITHICS			
Chipped Stone			
Flake frag., unmodified			
Secondary	1		1
Debris, unmodified		1	1
Total	1	1	2

Test Pit 2, situated downslope from Test Pit 1, was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. The stratigraphic sequence was identical to that of Test Pit 1, though Stratum 1 in Test Pit 2 averages 20 centimeters (7.9 inches) in thickness. One piece of chipping debris was recovered from the upper ten centimeters (3.28 inches) of Stratum 1; however, no other artifactual materials were recovered from the unit.

The apparent discrepancy between the results reported by Alexander (1979) and those of our testing program necessitated the placement of a gradall cut in the middle portion of the site in order to define any possible trace of cultural activity. A five-meter (16.4-foot) square cut was stripped to a depth of 30 centimeters (11.9 inches), and the surface shovel skimmed and trowelled. No features or artifactual material were defined or recovered from the gradall cut.

It is clear that the degree of land modification, resulting from pasture maintenance and plowing, has severely disturbed the integrity of this site. The extremely low artifact density (Table 40) in the site area as defined by Alexander may indicate that the disturbance has caused downward erosion and the subsequent displacement of artifacts. Although Alexander did report an Alba point, our investigations produced no additional diagnostic materials that would either add to or substantiate his chronological suggestion. The only point that might be made is that a general Archaic assignment seems somewhat questionable since Alba points are defined in some references as starting around the time of Christ and continuing to about 1200 A.D. (Bell 1960), while, in the Caddoan area, this point is rather securely dated to 700 A.D. to about 1200 A.D. (Suhm and Kreiger 1962).

1Ma159: Intrusion and Topography

The northern end of the upland ridge complex west of the Boundary Canal ends in a broad, low nose, which is bordered by the canal on three of its sides. The width of this northeast-southwest-trending rise is approximately 250 meters (820 feet). A wet depression occupies most of the southeastern half of the rise, and 1Ma159 occupies a very low knoll on the off-center crest in the northwestern half. Southwest from the site, the surface rises, on an approximately three per cent slope, to a ridge crest knoll approximately four meters (13 feet) in elevation above the site. The present depression bottom is less than two meters (6.6 feet) in elevation below the site, and the Boundary Canal bottomland is approximately two meters (6.6 feet) lower. The bottomland rise which contains 1Ma226 lies across the Boundary Canal to the northeast.

Elsewhere in the study area, from one to two meters (3.28 to 6.6 feet) of historic slope-wash deposits (colluvium) were found in sinks and depressions (see topographic discussions for sites located in the Boundary Canal Basin and Adjacent Uplands and Huntsville Spring Branch Basin). In all probability, at least 0.5 meters (1.6 feet) of historic colluvium and alluvium are present in the depression adjacent to 1Ma159. A stream, or a sequence of small bogs and pools, connected by poorly-defined, very shallow channels, is present in the Boundary Canal bottomland, and could have supplied at least a seasonally active source of water for the site's inhabitants.

The closest supply of local chert is approximately four kilometers (2.5 miles) to the north, in the Byrd Spring area. Chert and sandstone are also present on Weatherly and Mathis mountains, approximately 3.5 kilometers (2.2 miles) to the east.

1Ma159: Archaeological Investigations

The site area is in a cultivated field, which is also used as pasturage for cattle (Figure 99). A little-used farm road forms the northern boundary of the site.

Previous Work: Alexander (1979:131-132) originally recorded the site during the 1978 reconnaissance of selected portions of Redstone Arsenal. At that time, the site was classified as a moderate lithic scatter, approximately 40 meters (131 feet) long, and 20 to 30 meters (65.6 to 98 feet) wide. Alexander was unable to assign cultural affiliation to the site, as he indicates that no cultural materials were recovered during the examination of the location. Presumably, some material was observed, however, that is unclear, from the description.

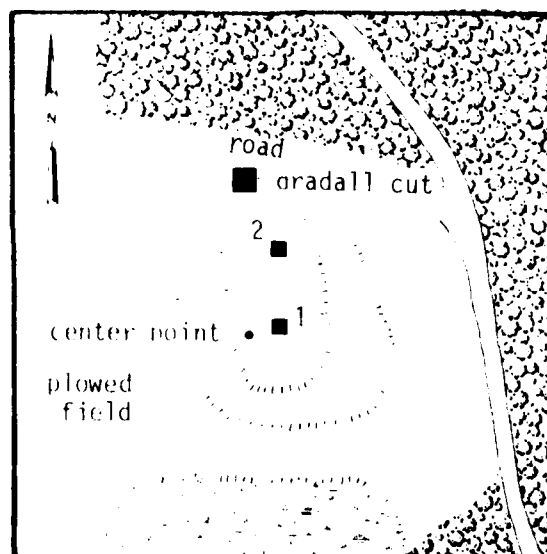


FIGURE 99. SKETCH MAP OF SITE 1Ma159.

Subsequent to the initial examination of the site area, but prior to the test program, the site location was revisited by Alexander and senior project personnel, who, at that time, found one unidentified projectile point during the general reconnaissance of the site area.

Current Work: The lack of surface artifactual indications necessitated the selection of an arbitrary centerpoint, from which to run the radials. The center of the slight knoll was selected, and the radials completed. Surface artifact density was extremely low, with a total of three flakes recovered, two from the east radial and one from

the south radial. All three were flake or flake fragments. The inability to define the boundaries of the site, based on the radial program, led to the implementation of a transect set placed north-south across the length of the site area. Five transects, spaced at 15-meter (49-foot) intervals, produced four additional flakes or pieces of debris, all from the three easternmost transects.

The lack of surficial definition to the site location is partially a result of cultivation and continuing use of the area for agricultural purposes. A degree of erosion, resulting from cultivation, is also obvious. In order to clarify to some degree the possible presence of intact subsurface features, the two test units and the later gradall cut were placed either on the knoll, or slightly downslope on the north-facing slope of the knoll.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface, although only one-half of the third level was excavated. Two strata were defined in the unit. Stratum 1 is a silty loam plowzone, reddish-brown (5YR 4/4), which is disturbed by root activity in the upper levels. The stratum averages approximately 16 centimeters (6.3 inches) in depth, and yielded only one flake from the lower level. Stratum 2 is a sub-plowzone, red (2.5YR 4/6), silty clay loam, which was sterile of artifactual material.

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. It exhibited a profile identical to that of Test Pit 1, though the maximum depth of Stratum 1 was 20 centimeters (7.9 inches). As with Test Pit 1, the artifactual material, one tertiary flake, was confined to the lower levels of Stratum 1.

The low artifact yield from the surface boundary definition procedures and the test pits did not rule out the possibility that subsurface features might be present. Therefore, a gradall cut, five meters (16.4 feet) square, was placed along the northern edge of the knoll. The cut was approximately 10 to 30 centimeters deep (3.28 to 11.9 inches), and, following the cut, was shovel- and trowel-skimmed, in order to define with accuracy any possible features. No features were found.

This site is clearly a light lithic scatter with all artifactual material confined to the plowzone (Table 41). No diagnostics were recovered during the investigations, so no chronological assignments may be made.

TABLE 41. ARTIFACTS RECOVERED FROM 1Ma159.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Secondary	1			1
Tertiary	1	1	1	3
Flake frag., unmodified				
Tertiary	2			2
Debris, unmodified	3			3
Projectile points				
Unidentified	1			1
Total	8	1	1	10

1Ma219: Archaeological Investigations

The site is situated immediately to the north of one of the compounds on Redstone Arsenal. The site is composed of a standing cattle pen and associated historic pile of rubble and debris, which may be an old house foundation or farm outbuilding (Figure 100).

Current Work: The site was found during the survey of selected portions of the project corridor. The site area is completely surrounded by plowed fields, and the cultivation appears to have accentuated slight depressions and rises throughout the field area. A general reconnaissance of the site area indicated that the cattle pen, which lies to the east of the pile of debris and rubble, is slightly elevated in relation to the rubble area. A series of radials was conducted in the area of debris, and extended southeast, past the cattle pen.

Current Results: The results of the radial program (Figure 101) indicated that a highly concentrated area, lying to the northwest and north of the cattle pen, composed of brick fragments and sandstone rubble, was present. However, no other cultural materials were found that would indicate the use or possible function of the rubble and brick combinations (Table 42). The rubble and brick were not collected.

1Ma158: Introduction and Topography

1Ma158 occupies the nose of a low rise east of the Boundary Canal bottomland, and is approximately one meter (3.28 feet) in elevation above it. A 150-meter (492-foot) wide, east-west swale forms the southern boundary of the rise, and divides it from a higher upland

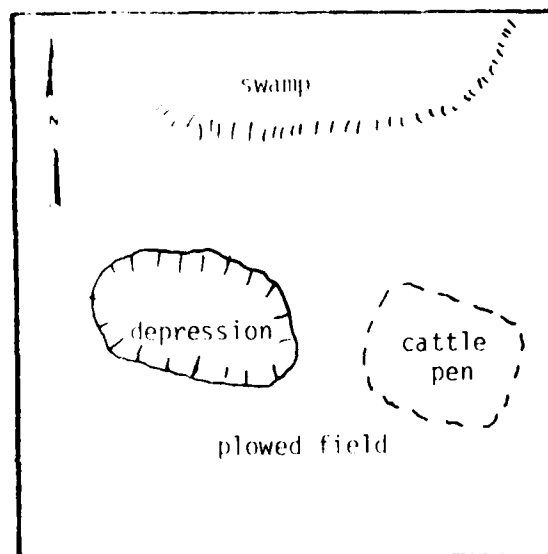


FIGURE 100. SKETCH MAP OF SITE 1Ma219.

TABLE 42. ARTIFACTS RECOVERED FROM 1Ma219.

	Total Surface, Radials, & S. P.
HISTORIC	
Glass	
Unid. bottles	1
Green	
Miscellaneous	
Mod. hollow brick	1
Total	2

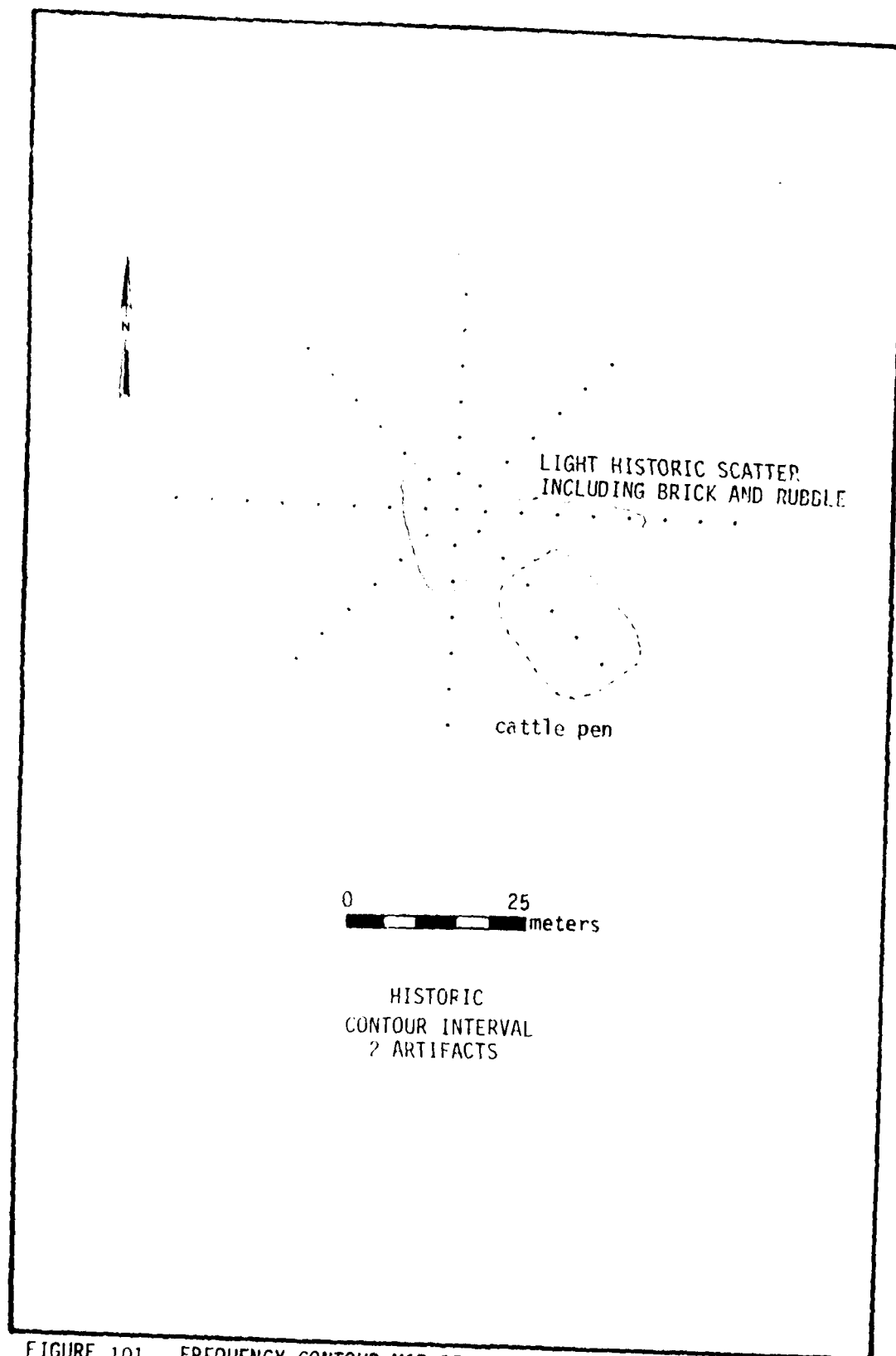


FIGURE 101. FREQUENCY CONTOUR MAP OF SITE 1Ma219 SHOWING RADIAL TRANSECTS.

ridge to the south. Backhoe Trench I 28-1, on the slope between the site and the east-west swale, exposed a section of 30 centimeters (11.9 inches) of recent colluvium and alluvium over the prehistoric hill slope. Aerial photographs taken in 1937 showed a pond in the bottomland west and southwest of the site.

From the interpretation of the topographic, soils, and aerial photographic data, a tentative reconstruction of the prehistoric drainage can be made (see geological discussions in site descriptions concerned with the Boundary Canal Basin and Adjacent Uplands). Probably several sinks were present in the basin of the present Boundary Canal. Streams from the uplands to the west of the 1Ma158 rise emptied into the portion of the basin west of the rise, theoretically through the drainage swale south of it, which is presently blocked. Either a stream flowing north, or a large pond, was present in the adjacent bottomland.

Local sandstone and chert could have been obtained from the outcrops around Byrd Spring (slightly more than four kilometers, or 2.5 miles, to the north), and at Weatherly and Mathis Mountains (three to four kilometers, or 1.7 to 2.5 miles, to the east). Sandstone, chert, and shale were available at Bell Hill, approximately 2.5 kilometers (1.5 miles) southeast of the site. Gravels of chert and other rock types were present in the Tennessee River terraces, four kilometers (2.5 miles) to the south.

1Ma158: Archaeological Investigations

The site lies immediately west of a farm road, which served as the eastern boundary of the site during the project. The site location is currently in cultivation, and the site knoll slopes gently to the north, west, and south from the rise crest (Figure 102).

Previous Work: The site was originally reported and recorded by Alexander (1979:130-131). A surface collection was made, and shovel-testing conducted, in order to determine the presence of possible features or artifacts below the plowzone. On the basis of both procedures, the site was judged to be approximately 75 meters (246 feet) north-south, and 40 meters (131 feet) east-west, and was classified as a moderate lithic scatter. Two diagnostic projectile points were recovered, a Late Archaic Stemmed and a Little Bear Creek, in addition to biface and biface fragments, two scrapers, and both utilized and reduction flakes. On the basis of the diagnostics, the site was assigned to the Late Archaic.

Current Work: A general surface reconnaissance was made of the site location, and it appeared that all cultural manifestations were located to the west of the farm road (Figure 102). An arbitrary centerpoint was located slightly to the north of the knoll/rise crest, and the radial procedure conducted. While the radials indicated that artifactual material was present on the rise crest, they also indicated that downslope displacement of artifactual material was occurring to the west and southwest of the rise, with the most

consistent expression of the site occurring along the southwest radial line (Figure 103). The highest concentration of material for any one collection square was six, along the western radial arm, at the bottom of the rise. Although the majority of the material recovered from the site surface was flakes or flake fragments, two scrapers and two projectile points were also recovered. The projectile points are a Benton Stemmed and a Benton Broad Stemmed, which date from the Middle Archaic to the Late Archaic (Table 43, Plate 79).

The artifact distribution superficially allowed for placement of the test pits in high-frequency areas. Test Pit 1 was placed just to the northeast of the rise crest and centerpoint, while Test Pit 2 was placed just to the east of the high-concentration area along the western radial, on the downslope side of the rise.

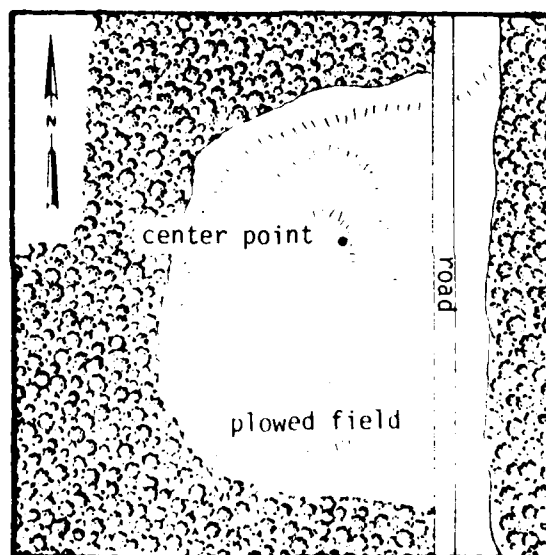


FIGURE 102. SKETCH MAP OF SITE 1Ma158.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Two strata were defined. The upper 20 centimeters (7.9 inches) is plowzone, Stratum 1, composed of a dark-reddish-brown (2.5YR 3/4), root-disturbed, silty loam. Three prehistoric artifacts, including a drill, and an unidentified piece of hard historic rubber, were recovered from the stratum. The underlying Stratum 2, a redder-than-red (2.5YR 4/6) silty clay loam, was sterile of artifactual material.

Test Pit 2, located, as noted, on the downslope side of the rise, was excavated in three arbitrary levels to a depth of 30 centimeters

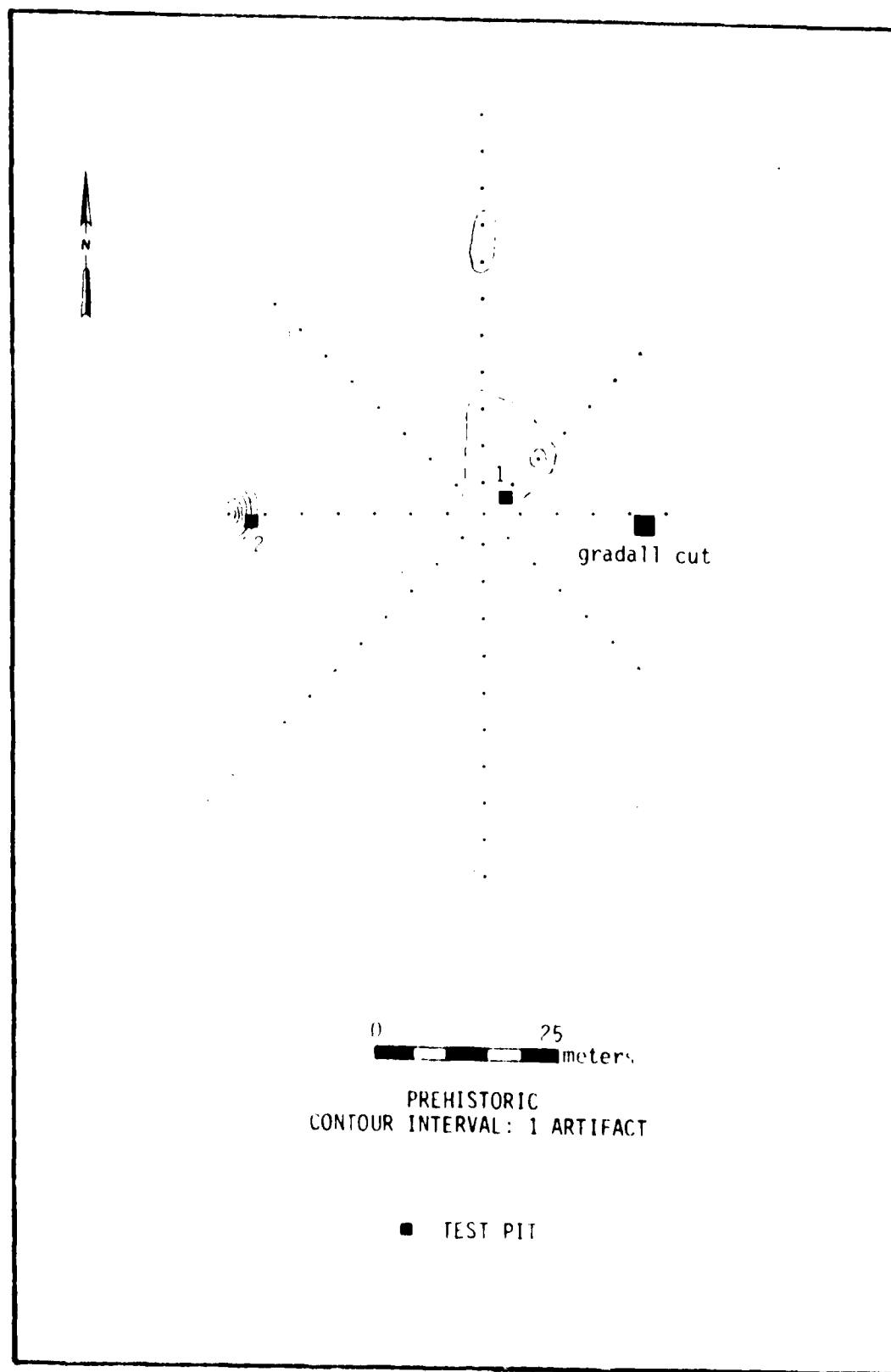


FIGURE 104. FREQUENCY CONTOUR MAP OF SITE 1N6158 SHOWING RADIAL
TRANSECT GRID AND TEST PITS.

TABLE 43. ARTIFACTS RECOVERED FROM 1Ma158.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Primary form	2			2
Flakes, unmodified				
Secondary	1			1
Tertiary	11	2	2	15
Flake frag., unmodified				
Secondary	1			1
Tertiary	3		3	6
Debris, unmodified	7			7
Unifacial tools				
Transverse scraper	1			1
Notched flake	1			1
Bifacial tools				
Drill		1		1
Scraper	1			1
Projectile points				
Benton Stemmed	1			1
Benton Broad Stemmed	1			1
Total	30	3	5	38
HISTORIC				
Miscellaneous				
Hard rubber, unid.		1		1
Total		1		1



PLATE 79. PROJECTILE POINTS FROM 1Ma154, 1Ma156, AND 1Ma158.
1Ma154: a, unidentified, possible Wade variant.
1Ma156: b, Morrow Mountain Rounded; c, Elora.
1Ma158: d, Benton Broad Stemmed; e, Benton Stemmed.

(11.9 inches). Despite the downslope position of the unit, it exhibited an identical profile to that of Test Pit 1. Plowzone Stratum 1 produced five artifacts, either tertiary or tertiary flake fragments, with the underlying Stratum 2 sterile of artifactual material.

Following the test-pitting, a gradall cut was placed in the eastern section of the site, on the rise. The gradall cut averaged 21 centimeters (8.3 inches) in depth, and was five meters (16.4 feet) square. Two possible features were identified, and the surface around each was trowel-skinned, to give better definition to the feature outline. One, in the southwest corner of the cut, was defined as a rodent burrow upon sectioning. The second, situated 7.5 cm (2.96 inches) from the western edge of the unit, approximately midway between north and south of the cut, was determined to be a postmold, following sectioning. The postmold was 14 centimeters (5.5 inches) in diameter, and 11 centimeters (4.3 inches) deep from the surface of the grader cut. The lack of associated artifacts or features may indicate that the postmold is historic, as opposed to prehistoric, though neither position can be validated.

The data from our investigations confirm that a Middle to Late Archaic occupation took place at the site (Table 43 and Plate 79). Artifact distribution would seem to indicate that, as was the case with 1Mal57, a certain amount of displacement of artifactual remains has occurred.

1Mal54, 1Mal55, and 1Mal56: Introduction and Topography

A large, lobed sink basin projects southwest into the uplands, west of the Boundary Canal bottomland. The basin is nearly one kilometer (0.6 miles) wide at its widest point, and is approximately one kilometer (0.6 miles) long. 1Mal54, 1Mal55, and 1Mal56 are located on the upland slopes which border the eastern and southeastern lobes of the sink, along the margin of an open lake, which was still present in 1937.

1Mal54 is on a low broad nose, which is a long narrow divider between the southeastern, southern, and western lobes of the basin (Figure 104). The slopes and uplands which surround the basin are situated in the angle between the Boundary Canal bottomland and the large sink. Gentle slopes of two to three percent predominate, except for low knolls or rises, which are elevated approximately two meters (6.6 feet) higher than the adjacent bottomland.

1Mal55 is on a short upland nose, which projects between the eastern and southeastern lobes of the sink (Figure 105). Slopes around the nose average three percent for a distance of 90 meters (294 feet) from the sink margin; then the surface becomes flatter, with slopes of approximately one percent. This flatter surface is approximately four meters (13.1 feet) in elevation above the present bottomland.

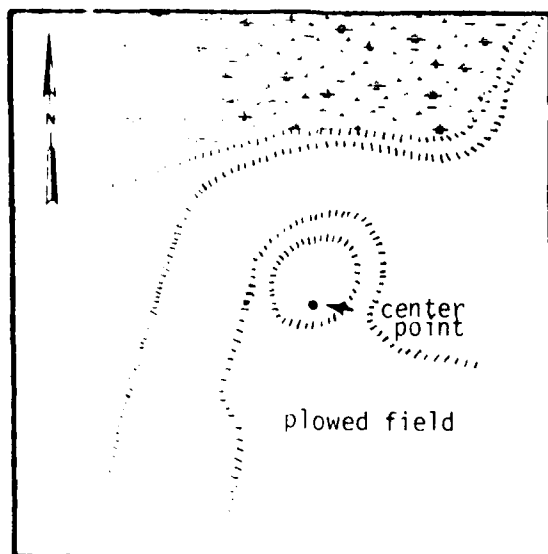


FIGURE 104. SKETCH MAP OF SITE 1Ma154.

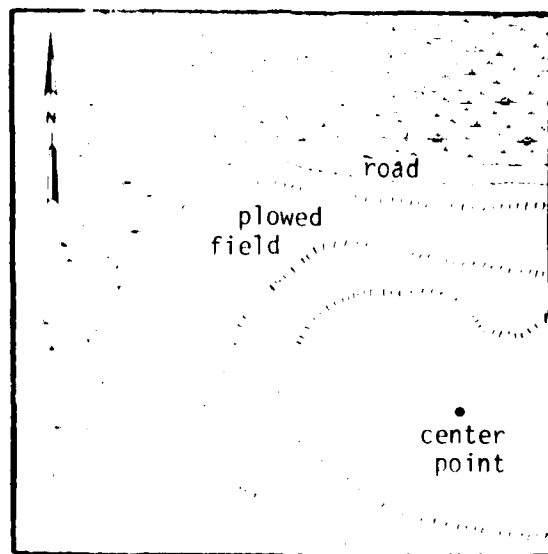


FIGURE 105. SKETCH MAP OF SITE 1Ma155.

IMa156 is on a low, broad nose, which projects northward from upland ridges to the south into the angle between the Boundary Canal and the sink. The rise slopes are very gentle, one to two percent, but are slightly greater along the southern margin, at the probable shore of the former lake. The rise, elevated approximately two meters (6.6 feet) above the adjacent bottomland, is bordered on three sides by the basin (Figure 106).

This sink complex is an excellent example of the geomorphic results of land collapse into subsurface solution channels. Probably since the early Pleistocene, the basin has contained a lake and/or ponds, swamps, and marshes. Springs were probably present within the basin, but no evidence of springs along the upland margin was detected.

As with the other sites in this area (IMa158, IMa159, IMa153), supplies of local chert, sandstone, and shale could be found at Bell Hill, 2.5 kilometers (1.5 miles) to the southeast. The Tennessee River terraces lie 3.5 kilometers (2.1 miles) to the south, and the river channel was no more than a few hundred meters farther; gravels with chert and other rock types could have been quarried there.

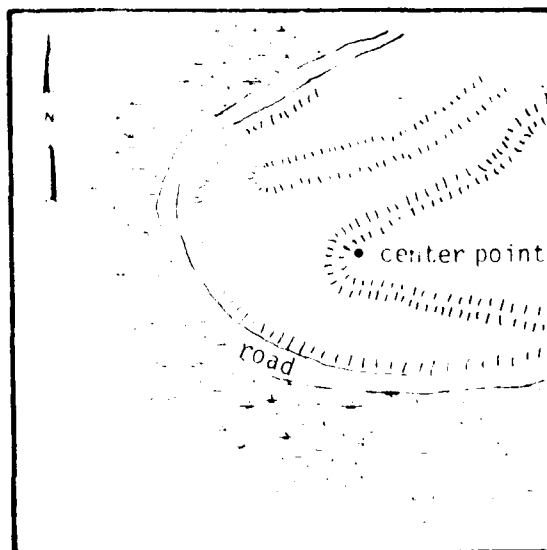


FIGURE 106. SKETCH MAP OF SITE IMa156.

IMa154: Archaeological Investigations

The site, one of five situated within one kilometer (0.6 miles) of each other, lies in a large, cultivated field. At the time of the project, the field was planted in winter wheat, and the crop was being used as pasturage for cattle. A farm road encircles the entire field, and access to IMa154, and to the other sites, is relatively simple.

Previous work: Alexander (1979:125-126), at the time of his initial recording, indicated that the site was a minimal lithic scatter, possessing no depth. He felt that the site's context had been destroyed to a great degree, both by plowing and by sheet erosion. All artifactual material recovered, which, though including a biface preform and biface midsection, produced no diagnostics, was recovered either from the surface or from the plowzone. The extent of the cultural deposits at that time was judged to be 30 to 40 meters (98 to 131 feet) in diameter.

Current Work: The upland slope on which the site is located is somewhat deceptive, giving the impression of a small rise on a more well-defined ridge. During the initial reconnaissance of the site area, it was apparent that surface artifactual material was present, but that there may have been downslope transportation of materials. Therefore, the centerpoint was situated slightly upslope, in an effort to define any unimpacted portions of the site (Figure 107). The radials indicated that the majority of artifactual material occurred within 30 meters (98 feet) of the centerpoint, though two isolated flakes were identified 50 meters (164 feet) upslope south of the centerpoint, and 25 meters (82 feet) upslope southeast. As can be noted on Figure 107, the highest frequency of material from any one collection unit was four, along the southwest radial, again upslope. The long axis of the site runs northeast-southwest for 47 meters (154 feet), with the centerpoint about the middle of the axis. The majority of artifactual material recovered during the radial boundary definition was flakes or flake fragments; however, a side scraper, knife fragment, and untyped projectile point were also identified. Both test pits were placed within high-frequency zones.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Two distinctive strata were defined. Stratum 1 is a yellowish-red (5YR 4/6) silty clay loam plowzone. As is typical for plowzone, small root activity was also noted throughout the stratum. All four flakes recovered from the unit came from Stratum 1. The sterile Stratum 2 is a strong brown (7.5YR 5/6) sandy clay loam. Small concretions were identified in the soil matrix; however, the stratum showed no signs of disturbance.

Test Pit 2, situated northeast of Test Pit 1, was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface. Although two strata were defined, they differed from the Test Pit 1 strata slightly. Stratum 1 is a silty clay loam, yellowish-red (5YR 4/6) plowzone, and the underlying Stratum 2 is a silty clay loam, red (2.5YR 4/6), sterile, sub-plowzone horizon. All five artifacts recovered came from Stratum 1, and included a flake fragment with scraping use.

The results both of the radial and of the test-pit programs indicated that cultural materials appeared confined to the plowzone. Because of inclement weather, it was not possible to place a grader

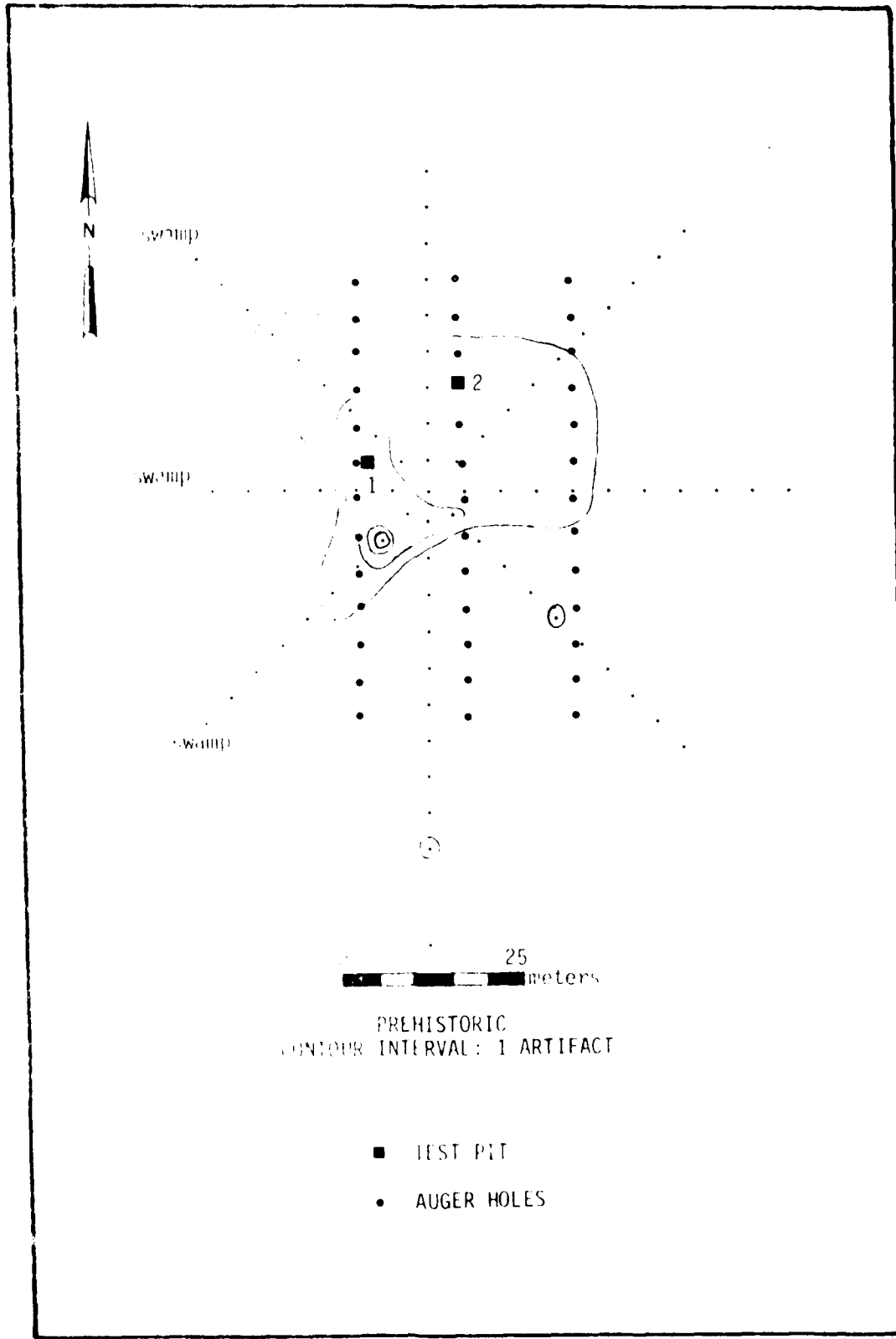


FIGURE 107. FREQUENCY CONTOUR MAP OF SITE 1Ma154 SHOWING RADIAL TRANSECT GRID, TEST PITS, AND AUGER HOLE.

cut at the site; however, three auger lines, spaced at 15-meter (49-foot) intervals from one another, were laid out north-south across the site, in order to determine the presence of intact midden or features. Auger holes along each line were spaced five meters (16.4 feet) apart, and average depth was 50 centimeters (19.7 inches). No evidence of features or midden was identified during the augering process.

This site is a light lithic scatter which yielded no diagnostic artifacts (Plate 79 and Table 44). The single projectile point, though similar to a Wade variety could not be typed with confidence. The site has been disturbed by agricultural activity that has obviously impacted the site integrity.

TABLE 44. ARTIFACTS RECOVERED FROM 1Ma154.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Primary form	1			1
Flakes, unmodified				
Secondary	2			2
Tertiary	13		1	14
Flake frag., unmodified				
Tertiary	3	3	1	7
Flakes, modified				
Secondary	1			1
Debris, unmodified	7	1	2	10
Core, unmodified	2			2
Unifacial tools				
Sidescraper	1			1
Spokeshave	1			1
Bifacial tools				
Unid. frag., scraping use	1		1	2
Knife fragment	1			1
Backside scraper	1			1
Projectile points				
Unidentified	1			1
Groundstone				
Small battered cobble	1			1
Battered pebble/small				
cobble fragment	1			1
Unmod. river cobble	1			1
Unmod. river cobble frag.	1			1
Total	39	4	5	48

1Mal55: Archaeological Investigations

The site is situated along the northern edge of a large, cultivated field. Immediately to the north of the site are a farm road and a wooden corral. As with the other sites in the field (1Mal56, 1Mal54, etc.), the site area has been impacted both from cultivation and from cattle grazing.

Previous Work: Alexander, during the 1978 survey of portions of Redstone Arsenal, classified 1Mal55 as a minimal lithic scatter, with all cultural material confined to the plowzone (1979:126-127). During his surface collection and shovel-testing program, he collected one complete projectile point, classified as either a Pickwick or Redbetter, a gouge/pick, biface preforms, four cores, and five dozen flakes falling into assorted classes. On the basis of the Pickwick/Redbetter association, the site was assigned a Middle or Late Archaic chronological position.

Current Work: A general reconnaissance of the site area was conducted, and the arbitrary centerpoint was selected. Surface artifact occurrences were quite low. The radial boundary definition procedure confirmed the general impression of the reconnaissance, with the highest frequency of artifacts in any collection square being two items. The long axis of the site is oriented northwest-southeast, encompassing a length of approximately 40 meters (131 feet). To the east of the centerpoint, a high-frequency area, composed of counts of two artifacts per collection square, runs approximately 20 meters (65 feet) north-south, and averages about five meters (16.4 feet) east-west (Figure 108). The primary core area of the site is, therefore, typified by one and two counts per collection square. Along the north, east, southeast, southwest, and west radials, isolated flakes are located between 15 and 20 meters (49 and 65 feet) from the boundary of the core area. The majority of the artifactual material recovered during the radial procedure was flakes or flake fragments (Table 45). Both test pits were located in the primary core area, with one (Test Pit 2) situated in the eastern, high-density area.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches). Two distinct strata were defined in the unit. Stratum 1 is a reddish-brown (5YR 4/4) silty loam plowzone. Due to the erratic profile of the ground surface, resulting from cultivation, the stratum averages between 15 and 20 centimeters (5.9 and 7.9 inches) thick, encompassing the first two arbitrary levels of the unit. All artifactual material recovered from the unit excavation came from Stratum 1. The assemblage composition consisted of flakes and flake fragments, though one modified tertiary flake and three pieces of debris were also identified. The underlying Stratum 2 is a dark-red (2.5YR 3/6), sterile, silty clay loam sub plowzone.

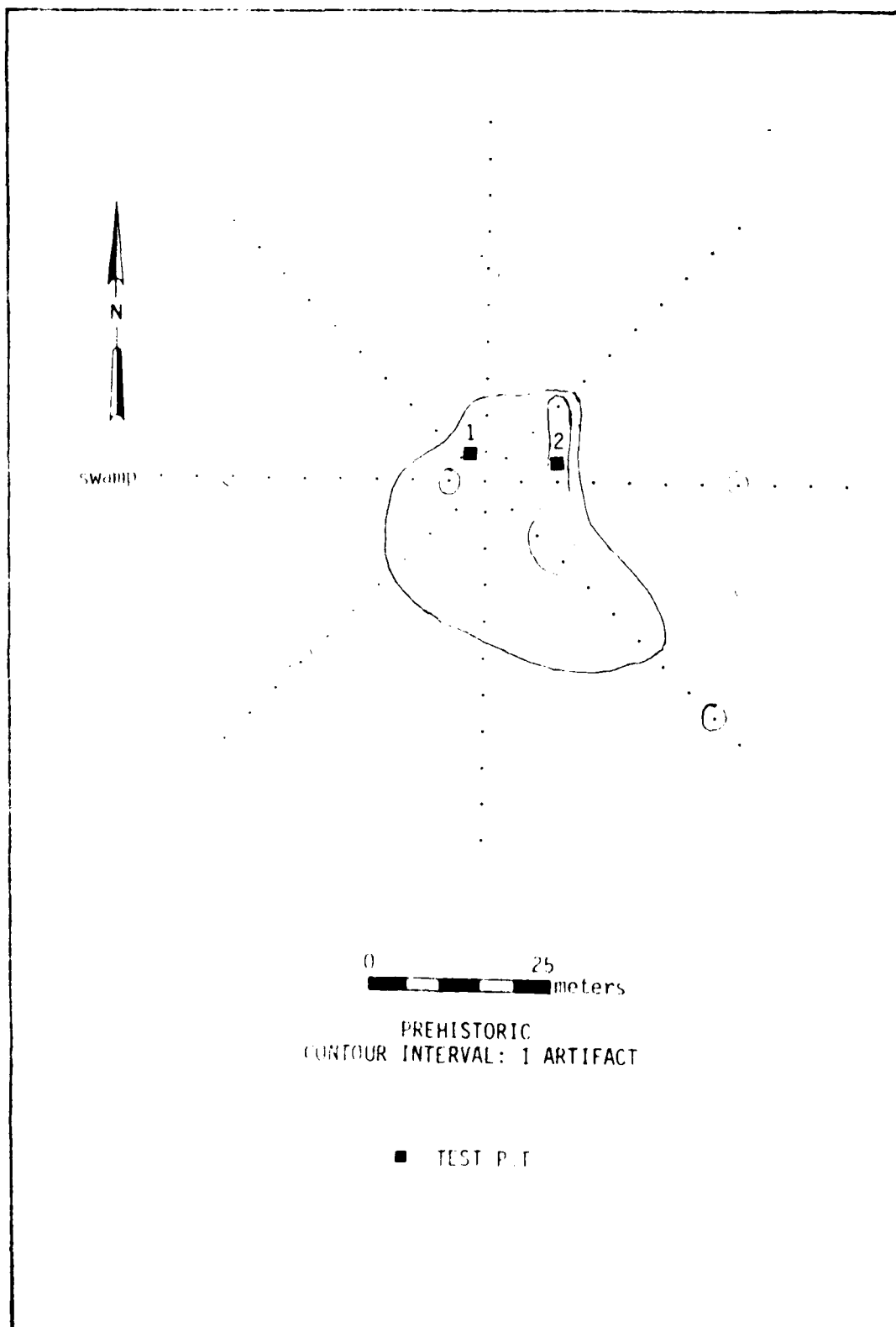


FIGURE 108. FREQUENCY CONTOUR MAP OF SITE 1Ma155 SHOWING RADIAL TRANSECT GRID AND TEST PITS.

TABLE 45. ARTIFACTS RECOVERED FROM 1Ma155.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified				
Secondary		1	3	4
Tertiary	7	1	9	17
Flake frag., unmodified				
Secondary	1	1		2
Tertiary	2	3	9	14
Flake fragments, modified				
Primary			1	1
Secondary			1	1
Tertiary	1	1	1	3
Debris, unmodified	15	3	7	25
Unifacial tools				
Graver			2	2
Bifacial tools				
Unid. frag., scraping use	1			1
Groundstone				
Battered pebble/small cobble fragment	1			1
Sm. frag. w/abraded surface, unid.	1			1
Total	29	10	33	72
HISTORIC				
Miscellaneous				
Hard rubber insulator frag.			6	6
Total			6	6

Test Pit 2, situated 15 meters (49 feet) due east of Test Pit 1, in the eastern high-density area, was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface. The profile of the unit was identical to that of Test Pit 1, with Stratum 1 (a reddish-brown, 5YR 4/4, silty loam plowzone) producing all the artifactual material recovered from the unit. Stratum 2, as with Test Pit 1, a silty clay loam, sterile subplowzone, was exposed, but excavation was not carried into this layer. The artifact assemblage from Stratum 1 was appreciably larger than that recovered in Test Pit 1, and included two gravers and six hard-rubber insulator fragments, the latter probable residue of the agricultural utilization of the site area.

A combination of relatively low artifact frequencies (Table 45), the confinement of all artifactual material to surface or plowzone contexts, and the inability to gain access to the site area with a grader because of muddy field conditions, led to the decision to conduct no further tests at the site.

On the basis of Alexander's work, a tentative date of Late Archaic can be suggested for this site; however, our data are insufficient to substantiate his conclusions.

1Ma156: Archaeological Investigations

The site is situated along the northern periphery of a large, cultivated field. As with the other sites in the field (e.g., 1Ma154, 1Ma155), the site location is also utilized as pasturage for cattle.

Previous Work: Alexander originally defined the site as a "small camp or village with an observable midden deposit" (1979:128). On the basis of his surface reconnaissance and subsurface testing, the site was judged to be approximately 100 meters (328 feet) long east-west, and 50 meters (164 feet) wide north-south, with a maximum depth to the cultural deposits of 40 centimeters (15.7 inches). A midden, with a concentration of fire-cracked rock and lithic debris, was reported. Artifacts were recovered both in surface and subsurface contexts, and the assemblage included nine classified projectile points, with Eva, Sykes-White Springs, Benton, Morrow Mountain, Hamilton Stemmed, Copena, Copena Triangular, and Greenville, among the types; these would indicate a span of occupation from, possibly, the Early Archaic, through the Late Archaic, and into the Woodland. In addition to the classified projectile points, four unclassified projectile points, biface preforms, several dozen flakes, and three ground stone pieces, including a pestle/mano and a mano/hammerstone, were recovered.

Current Work: At the time of Alexander's survey of the site location, the field was newly plowed. The general reconnaissance of the site area conducted in conjunction with the New World Research testing of the site and the subsequent radial boundary definition procedure did not indicate nearly so great frequencies of artifactual material as those identified by Alexander. The latter procedures were conducted during the winter months, however, and the field was supporting a crop of winter wheat. Following the selection of an arbitrary centerpoint, the radials were conducted, and indicated that the site orientation is generally northeast-southwest (45 meters or 147.6 feet). The highest frequency recorded in any one collection square was three items; that occurred three times along the east radial, and once along the northeast radial arm (Figure 109). The artifact assemblage resulting from a combination of the radials and general surface reconnaissance during the course of the radial procedure included several flake classes, two pieces of Mulberry Creek Plain, one example each of a side scraper, graver, and punch/graver, and two projectile points. The points are a Morrow Mountain rounded base and an flora. Both test pits were situated in high to medium density areas.

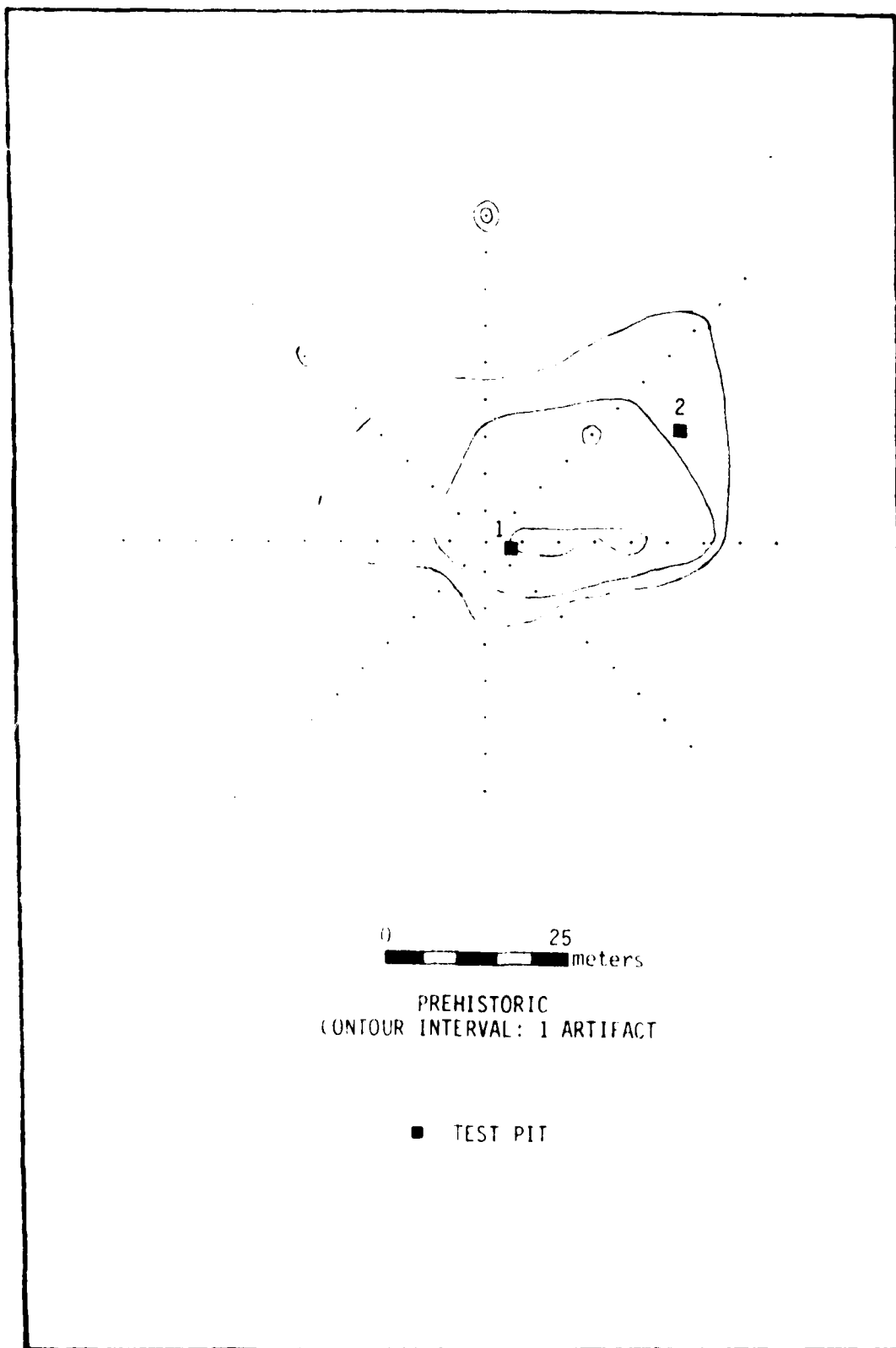


FIGURE 109. FREQUENCY CONTOUR MAP OF SITE 1Ma156 SHOWING RADIAL
TRANSECT GRID, AND TEST PITS.

Current Results: Test Pit 1 (Plate 80) was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. It was subsequently expanded in size in order to define a feature area. Two strata were defined. Stratum 1 is a silty loam plowzone, approximately 20 centimeters (7.9 inches) in thickness, and characterized as 5YR 4/4, reddish-brown (dry). Underlying Stratum 1 is a dark reddish-brown (5YR 3/3) silty loam sub-plowzone horizon (Stratum 2).



PLATE 80. 1Ma156 TEST PIT 1 FEATURE 1 (DISTURBED HEARTH). THE LIGHTER MOTTLED AREA IN THE PLATE CENTER IS BURNT CLAY.

In the northern portion of Stratum 2, a dark-red (2.5YR 3/6), lens was defined. Artifactual material, primarily flakes or flake fragments, was recovered from the area. In an effort to define the function of the stain, the unit was subsequently expanded to the east and south (Plate 80). The expansion indicated that the burnt clay, charcoal staining, and discoloration continued, and it appears that the feature is badly disrupted from plowing, and its probable original function was as a hearth.

Test Pit 2 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface, and two distinct strata were defined. Stratum 1 encompasses the upper 25 centimeters (9.8 inches) of the unit, and is a silty loam plowzone, dry, dark-reddish-brown (5YR 3/3). All artifactual material recovered from

the unit was found in Stratum 1, and included flakes, flake fragments, and debris. The underlying Stratum 2 is also a silty loam, dark-red (2.5YR 3/6); however, it is sterile of artifactual material, and shows no signs of charcoal staining or burnt clay, as was the case in Test Pit 1.

Because of the obvious presence of intact features at the site, and the comparatively large quantity of artifactual material reported both by Alexander and during the course of this project, no additional work was deemed necessary at the site at that time with regard to sub-surface testing or grader removal of overburden.

Artifact density at this site was moderate (Table 46). On the basis of both our work and that of Alexander, occupation for the site area is indicated in the Middle and Late Archaic, Early Woodland, and Middle Woodland periods. The Middle Archaic occupation is somewhat interesting at this site since Alexander reports an Eva point. It is possible that this site might yield information suitable to address the question of whether an Eva phase preceeds the Sanderson Cove Middle Archaic phase defined by Walshall (n.d.). As Dickson points out in Chapter 2, this earlier phase would be characterized by Eva or Eva-like points stratigraphically earlier than the typical Morrow Mountain markers of the Sanderson Cove phase. Our investigations provided no stratigraphic data to address this question since all of the projectile points were surface finds (Plate 79).

1Ma153: Introduction and Topography

The site is located on a hillside, on a gently sloping surface in the sink complex in which 1Ma154, 1Ma155, and 1Ma156 are situated. 1Ma153 lies along the margin of the head of a long, narrow sink, the southwestern lobe of the complex. The site elevation is some four or five meters (13 or 17 feet) above the adjacent bottomland, and more than two meters (6.6 feet) below ridge crests to the southwest and southeast. Only ephemeral stream swales can be associated with the site, although the bottomland, some 120 meters (393 feet) downslope to the northeast, probably contained either ponds or an arm of the larger lake. The bottomland is presently much modified by historic activity, with an artificial drainage channel collecting run-off from the surrounding uplands.

Lithic materials (chert, sandstone, shale) were available to the site's occupants from locations on Bell Hill, 2.5 kilometers (1.5 miles) to the southeast. Gravels of chert and other rock types could be found on the Tennessee River terraces, 3.5 kilometers (2.1 miles) to the south.

1Ma153: Archaeological Investigations

1Ma153 is situated in the southwest corner of a large, cultivated field, which is also used as pasturage for cattle (Figure 110). Pedestrian access to the site location is possible by going east from a farm road which encircles the field.

TABLE 46. ARTIFACTS RECOVERED FROM 1Ma156.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
CERAMICS				
Mulberry Creek plain	2			2
Total	2			2
LITHICS				
Chipped stone				
Flakes, unmodified				
Secondary	6	1	3	10
Tertiary	21	7	12	40
Flake frag., unmodified				
Tertiary	30	7	20	57
Debris, unmodified	29	8	9	37
Flakes, modified				
Tertiary	2	1	1	4
Flake frag., modified				
Secondary		1	1	2
Tertiary	1			1
Debris, modified	1		1	2
Core, unmodified	1	2		3
Unifacial tools				
Side scraper	1			1
Graver	1			1
Bifacial tools				
Unid. frag., no apparent usage	1			1
Punch/graver	1			1
Projectile points				
Morrow Mountain rounded	1			1
Flora	1			1
Groundstone				
Battered pitted cobble	1			1
Total	89	27	47	163

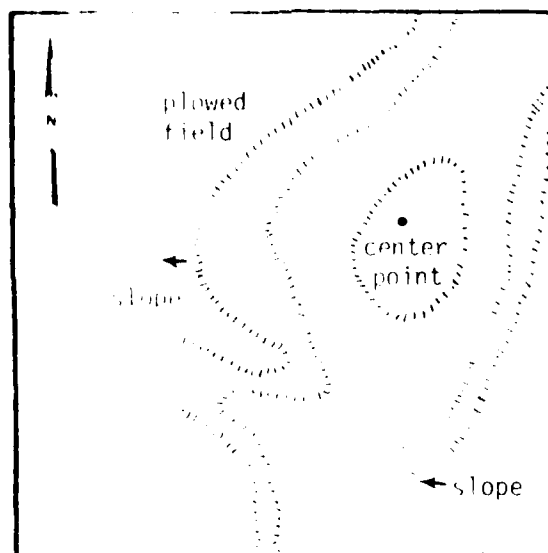


FIGURE 110. SKETCH MAP OF SITE 1Ma153.

Previous Work: The site, originally recorded by Alexander (1979:124-125), was described as a minimal lithic scatter, approximately 25 meters (82 feet) in diameter. Shovel tests indicated that all cultural material was confined to the plowzone. The recovered artifact assemblage included one biface preform and one biface fragment, a hammerstone, side scraper, and thirty-nine assorted flakes; however, no diagnostics were identified.

Current Work: A general surface reconnaissance of the site area was done, and an arbitrary centerpoint selected in the middle of a light scattering of artifactual material. The radials were conducted, and indicated that the major focus of cultural material was within 15 to 25 meters (49 to 82 feet) of the centerpoint, along the northeast, east, southeast, south, and southwest radials (Figure 111). Two isolated flakes were identified on the northeast and north radial lines, and their locations placed them about midway between 1Ma153 and 1Ma154 to the north. One other additional flake was identified, 15 meters (49 feet) south of the southern edge of the primary core area, on the south radial line. High density in any collection square was two items, with three consecutive squares along the east radial and one square on the southwest radial composing the highest-frequency contour. Given the low artifact density, both test units were placed either within or adjacent to the highest-frequency contour.

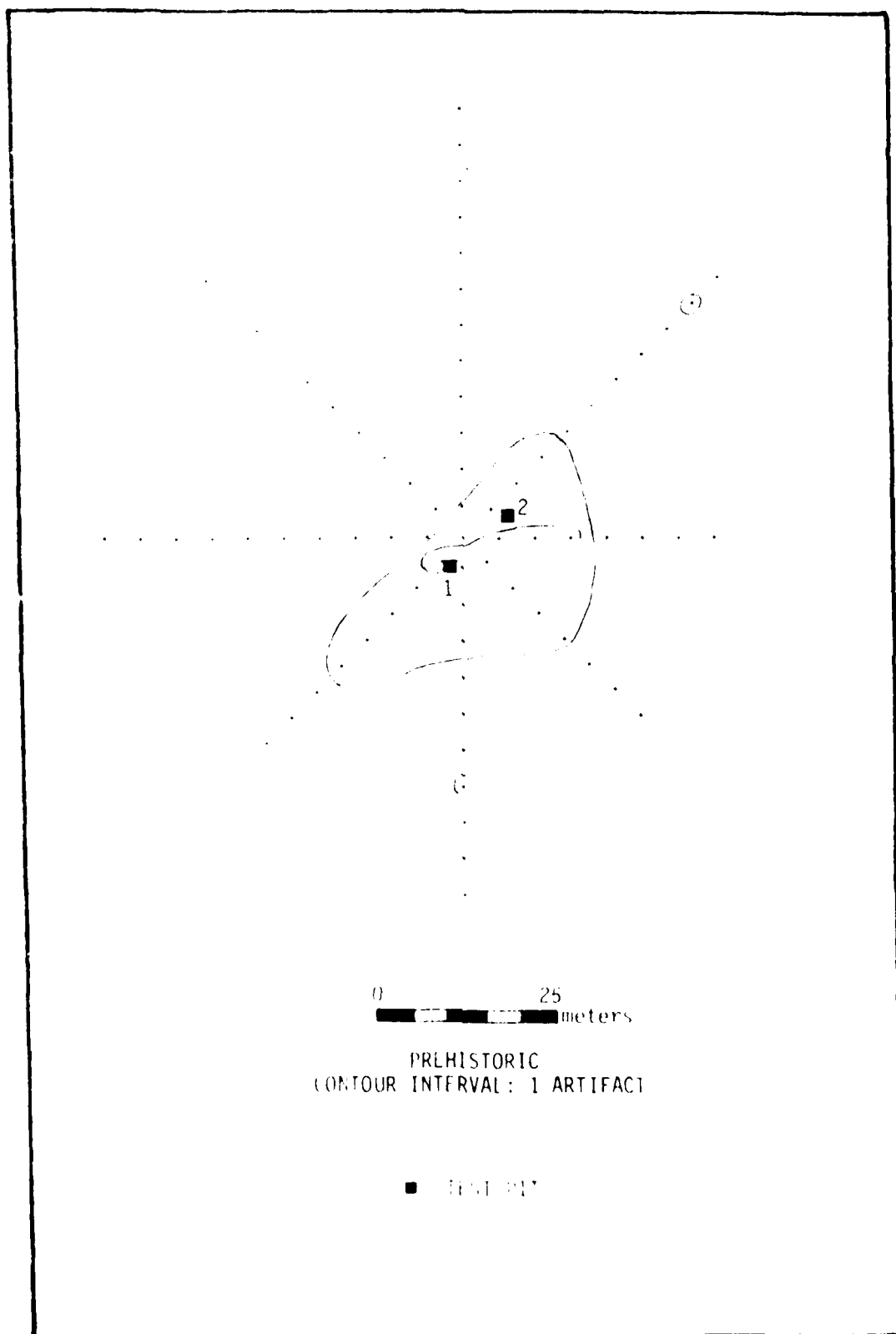


FIGURE 111. FREQUENCY CONTOUR MAP OF SITE 1Ma153 SHOWING RADIAL
TRANSECT GRID AND TEST PITS.

Current results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below the present ground surface. Two strata were defined in the unit. Stratum 1 is a reddish-brown (5YR 1/4) silty loam plowzone, with a maximum width of 20 centimeters (7.9 inches). Stratum 2 is a sterile, dark-reddish-brown (2.5YR 3/4), silty clay loam sub-plowzone. The artifacts recovered from Stratum 1 included two cores, two core fragments, two pieces of debris, and a tertiary flake fragment.

Test Pit 2 was excavated in two arbitrary levels to a depth of 20 centimeters (7.9 inches) below present ground surface. The profile was identical to that of Test Pit 1, though Stratum 1 was shallower, averaging 10 centimeters (3.28 inches) in thickness. The underlying Stratum 2 was sterile of artifactual material, and only two artifacts were recovered from Stratum 1, one tertiary flake and a piece of debris.

The low artifact yield (Table 4/), and lack of intact features or deposits, obviated the necessity to use either an auger or a grader. Therefore, no additional subsurface testing was conducted at the site. No diagnostics were recovered from our investigations so it is impossible to assign a chronological designation for the occupation.

TABLE 4/ ARTIFACTS RECOVERED FROM 1Ma153.

	Surface, Radials, & S. P.	T.P. 1	T.P. 2	Totals
CHIPPED STONE				
Flakes, unmodified				
secondary	2			2
tertiary	1		1	2
Flake frag., unmodified				
tertiary		1		1
Debris, unmodified	12	2	1	15
Core, unmodified	3	2		5
Core frag., unmodified		2		2
Unifacial tools				
End scraper on chunk	1			1
Total	19	7	2	28
PEBBLES				
Total				
Horse shoe iron sand	1			1
Total	1			1

11a152: Introduction and Topography

The site is on a knoll on an upland ridge slope west of the Boundary Canal Basin bottomland. Slopes of approximately five per cent lead down to the bottomland margin, some 250 meters (820 feet) from the site. The top of the knoll is approximately 100 meters (328 feet) wide, and the south side is formed by the slope of a first-order drainage swale. The swale was filled during historic times (as shown by the profile in Trench I 25-1), and is again developing a deep gully. There is no evidence of a sapping depression at the head of this gully, adjacent to the site, but land-leveling could have obliterated evidence of seeps. Failing the presence of seeps at that elevation, the nearest water source available, not considering such sources as wells, would be the Boundary Canal bottomland, 250 meters (820 feet) or more from the site (Plate 81).

11a152: Archaeological Investigations

11a152 is a two-component site, with a minimal prehistoric occupation and a well-defined historic occupation. The site is situated at the extreme southeastern corner of the large, cultivated field, which is also used as pasturage for cattle (Figure 112).

Previous Work: Alexander reported the site as a two-component occupation, approximately 50 meters (164 feet) north-south, and 30 meters (98 feet) east-west. During the course of surface collection and shovel-testing, he recovered three diagnostic projectile points, a Copena triangular, Flint Creek, and Morrow Mountain, in addition to numerous historic artifacts. Although the source of his information concerning the historic occupation is not cited, Alexander indicates that several structures have been identified for the site, including a possible blacksmith's shop and a powder magazine used during the Civil War (1979:123-124). The prehistoric component, on the basis of the projectile points, was classified as Archaic/Woodland.

Current Work: A general surface reconnaissance was made of the site location, specifically to examine the area for indications of foundation outlines. None could be identified surficially, and an arbitrary centerpoint was situated at the crest of the knoll. Radials were conducted in the cardinal and subcardinal directions, and indicated that the majority of the artifactual material was historic in nature, and was distributed east-west along the knoll crest, and downslope to the south and southeast (Figure 113; Table 48). Only a limited amount of material indicative of the prehistoric occupation was identified, and consisted of four lithics, a modified secondary flake, a modified tertiary fragment, a piece of modified debris, and an unmodified tertiary flake. Highest density in any collection square was three artifacts, with a well-defined central core of frequencies of two and three artifacts per collection square.



PLATE 81. UPLAND SWAMPY DEPRESSIONS TO THE NORTH OF THE 1Ma152-1Ma156 COMPLEX WITHIN THE BOUNDARY CANAL BASIN PHYSIOGRAPHIC ZONE.

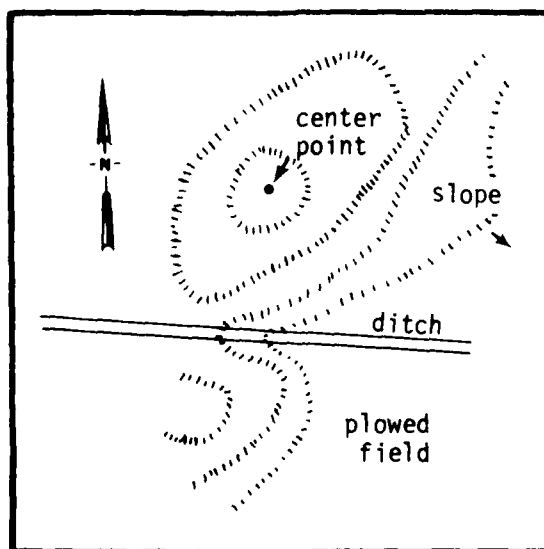


FIGURE 112. SKETCH MAP OF SITE 1Ma152.

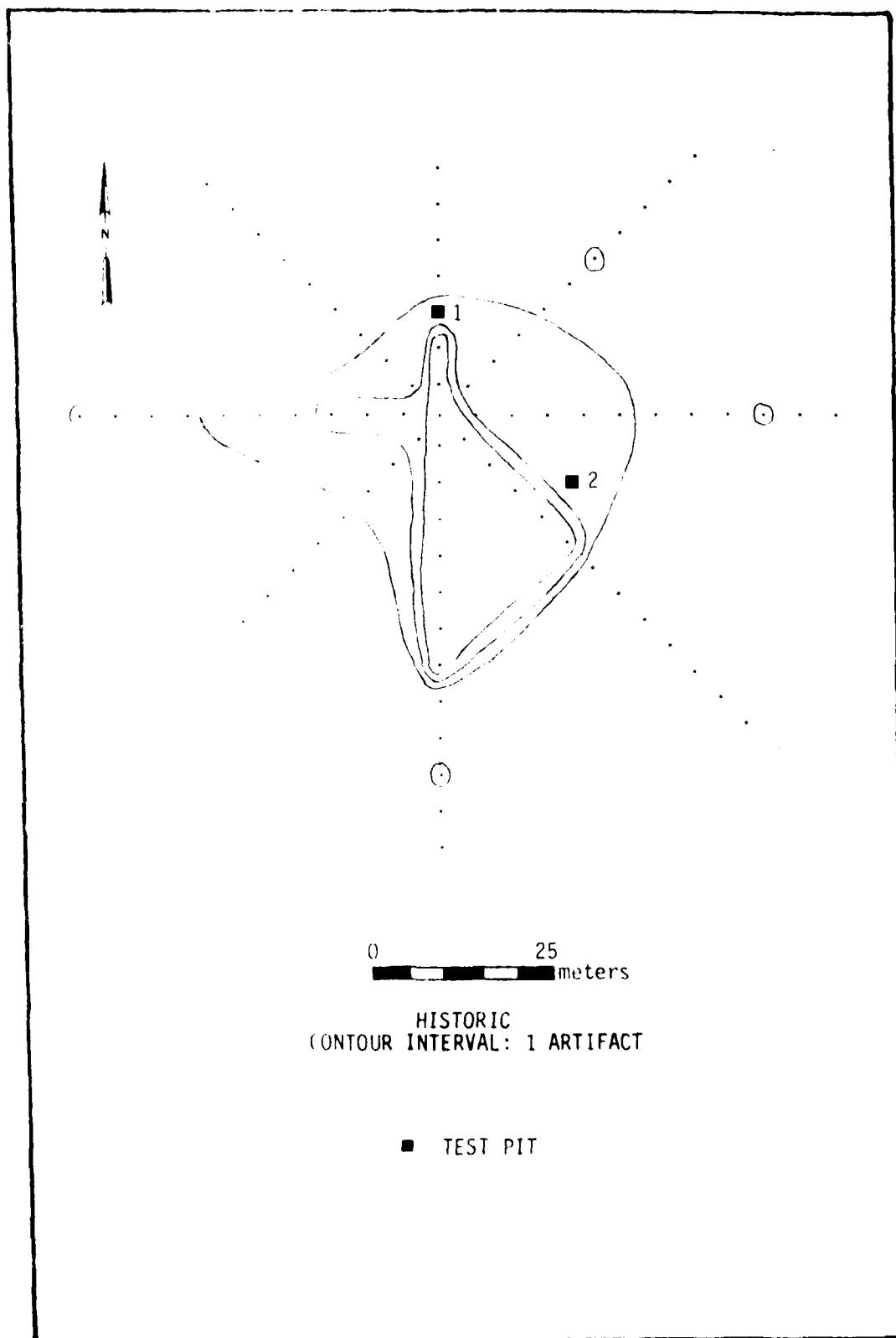


FIGURE 113. FREQUENCY CONTOUR MAP OF SITE 1Ma152 SHOWING RADIAL TRANSECT GRID AND TEST PITS.

TABLE 48. ARTIFACTS RECOVERED FROM 1M4152.

	Surface, Radials, K.S. P.	I.P. 1	I.P. 2	Totals
LITHICS				
Chipped stone				
Flakes, unmodified	1			1
Tertiary				
Flakes, modified	1			1
Secondary				
Flake fragments, modified	1			1
Tertiary	1			1
Debris, modified	1			1
Core, unmodified	1			1
Limestone fragment	1			1
Total	4	2		6
HISTORIC				
Glass				
Unid.				
Pane glass	2	13	1	14
Milk glass				2
Unid.	1	1		2
Jar lid sealers	10			10
Soft drink				
Unid.	3	1		4
"Gay Cola, Huntsville, Alabama"	1		1	2
Unid. bottles				
Aqua	5	3	1	9
Clear	26	55	3	84
Brown	17	14		31
Milk (opaque)	3			3
Amethyst	7	6		13
Green		2		2
Jars, other				
Opaque	3			3
Aqua	1	1		2
Medicine bottle				
Post 1920 blue	1			1
Ceramic				
Ironstone				
Undec.	31	3	5	39
Blue	1			1
Rockingham ware	1			1
Whiteware				
Undec.	1		1	2
Salt glaze	1			1
Green	1			1
Porcelain				
Undec.	1			1
Overglaze dec., undetermined	1			1
Stoneware				
Undec.	1			1
Salt glaze	1			1
Black slip	4			4
Lead glaze	2		1	3
Hotelware				
Undec.	1			1
Undec. feather edge	1			1
Metal				
Iron				
Chain links	1			1

[illegible]

In addition to the radials, the site was divided into four quadrants bounded by the north-south, east-west lines, and systematic sweeps of each quadrant were made at ten-meter (32.8 foot) intervals, in order to define any pattern to the distribution of historic and prehistoric artifactual material. Although no patterns could be discerned, it was apparent that the primary focus of occupation was on the knoll crest, toward the south and southeast of the centerpoint.

Current Results: Test Pit 1 was excavated in three arbitrary levels to a depth of 30 centimeters (11.9 inches) below present ground surface. Two distinct strata were defined. Stratum 1 is a yellowish-brown (2.5YR 4/4) silty clay loam, which contains charcoal flecking and limestone cobbles scattered throughout the fill. The limestone showed no indications of modification; however, it may be remnant material from the historic occupation. The underlying sterile subplowzone is a red (10R 4/6) silty clay. The artifactual material recovered from Stratum 1 included one prehistoric item (a core), and over a hundred examples of historic metal, including one plow part, glass, and eight pieces of ceramics (Table 48).

Test Pit 2, situated somewhat downslope to the southeast, was excavated in two and one-half arbitrary levels to a depth of 25 centimeters (9.84 inches) below present ground surface. The upper Stratum 1, averaging approximately 13 centimeters (5.12 inches) deep, is a silty clay, yellowish-brown (2.5YR 4/4), plowzone. The stratum produced the only artifacts, all historic, recovered in the unit. The underlying Stratum 2 is a red (10R 4/6), sterile, silty clay sub-plowzone.

On the basis of Alexander's data, the prehistoric component at the site dates to the Middle and Late Archaic; however, we recovered no artifacts in support of this assignment (Table 48). It was learned subsequent to the investigations that following Alexander's work at the site, the area was subjected to unauthorized grader activity. The work apparently involved the scraping of topsoil, subsoil removal downslope, and replacement of topsoil. This operation undoubtedly clarifies the mixed artifactual contexts, and may account for the absence of historic structural indications. Although the historic artifacts at the site were extensive (Plates 82, 83, and 84), no material was recovered that can be definitely assigned to the Civil War or immediate post-Civil War era.



PLATE 82. HISTORIC ARTIFACTS FROM 1Ma 152.
a, Plastic Button; b, Pipe mouth piece; c, unidentified
Battery; d, Iron Toy Gun fragment; e, Iron Horseshoe
fragment.



PLATE 83. HISTORIC ARTIFACTS FROM 1Ma152.

a, unidentified Amethyst bottle fragment with tool applied lip; b, Aqua bottle base with embossed anthropomorphic figure; c, soft-drink bottle base, with "Gay Cola Bottling C., Huntsville, Ala." embossed around the base; d, milk glass jar lid sealer fragment.



PLATE 84. HISTORIC CERAMICS FROM 1Ma152.

a, Ironstone fragment with blue annular decoration;
 b, Whiteware fragment with unidentified green decoration;
 c, Porcelain fragment with undetermined red overglaze design;
 d, Ironstone Pitcher Handle fragment;
 e, undecorated Ironstone Bowl Base fragment with unidentified portion of Potter's Mark;
 f, Stoneware fragment with black slip;
 g, Stoneware fragment with lead glaze.

9. INTERPRETATIONS

by

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A total of 43 sites were investigated during the survey and testing program conducted by New World Research, Inc., in the Redstone Arsenal study corridor (Figure 114). As discussed in Chapter 7, the project included several phases: 1) an intensive survey of nine systematically selected sample quadrants; 2) an off-sample survey of five additional quadrants; 3) the location of known sites within the study corridor, but outside the off-and on-sample survey areas; and 4) test and evaluation of all known sites and a selected number of those newly discovered in the study corridor. Table 49 presents a listing of all 43 sites, broken down by study corridor location, status (new or formerly reported), physiographic association, soil association, size, and general chronology. Twenty-one of these sites were located in the on-sample survey quadrants, 13 were in the off-sample survey quadrants, and nine were outside the survey area, but within the study corridor. This last group of nine sites were all previously known, although one, reported to us by Alexander, had not received a permanent site number (now 1Pa209).

In the research design, we pointed out that the principal thrust of this project was the development of a predictive model of site location for the Redstone Arsenal project area. Once established, this model forms the basis for broader interpretations of chronology and settlement and subsistence patterns reflected in the site data and the implication of these interpretations for the general cultural region that encompasses the Middle Tennessee Valley and the Wheeler Basin.

Predictive Model

An important point was made in the discussion of sample selection that it is crucial that the predictive model be based on survey results from a carefully selected sample area. Accordingly, we shall, in the following pages, develop a model of site location based on the on-sample survey results alone. The on-sample survey sites include the 14 newly discovered sites located in the systematically selected sample of nine survey units. Added to these are seven previously reported sites located in the sample units, bringing the total to 21 sites. Of these 21 sites, 17 have prehistoric components, five have historic components, and four contain evidence of both prehistoric and historic activity. Thus, the total number of components represented at the 21 sites is 25.

LEGEND FOR FIGURE 114.

- 1 - HUNTSVILLE SPRING BRANCH BASIN (HSBB)
- 2 - UPLANDS NORTH AND EAST OF HUNTSVILLE SPRING BASIN (UEHSB)
- 3 - UPLANDS SOUTH OF HUNTSVILLE SPRING BASIN (USHSB)
- 4 - BOUNDARY CANAL BASIN AND ADJACENT UPLANDS (BCB)
- 5 - BELL HILL (BH)
- 6 - UPLAND TENNESSEE RIVER TERRACES (UTR)
- 7 - TENNESSEE RIVER TERRACE AND BOTTOMLAND (TR)

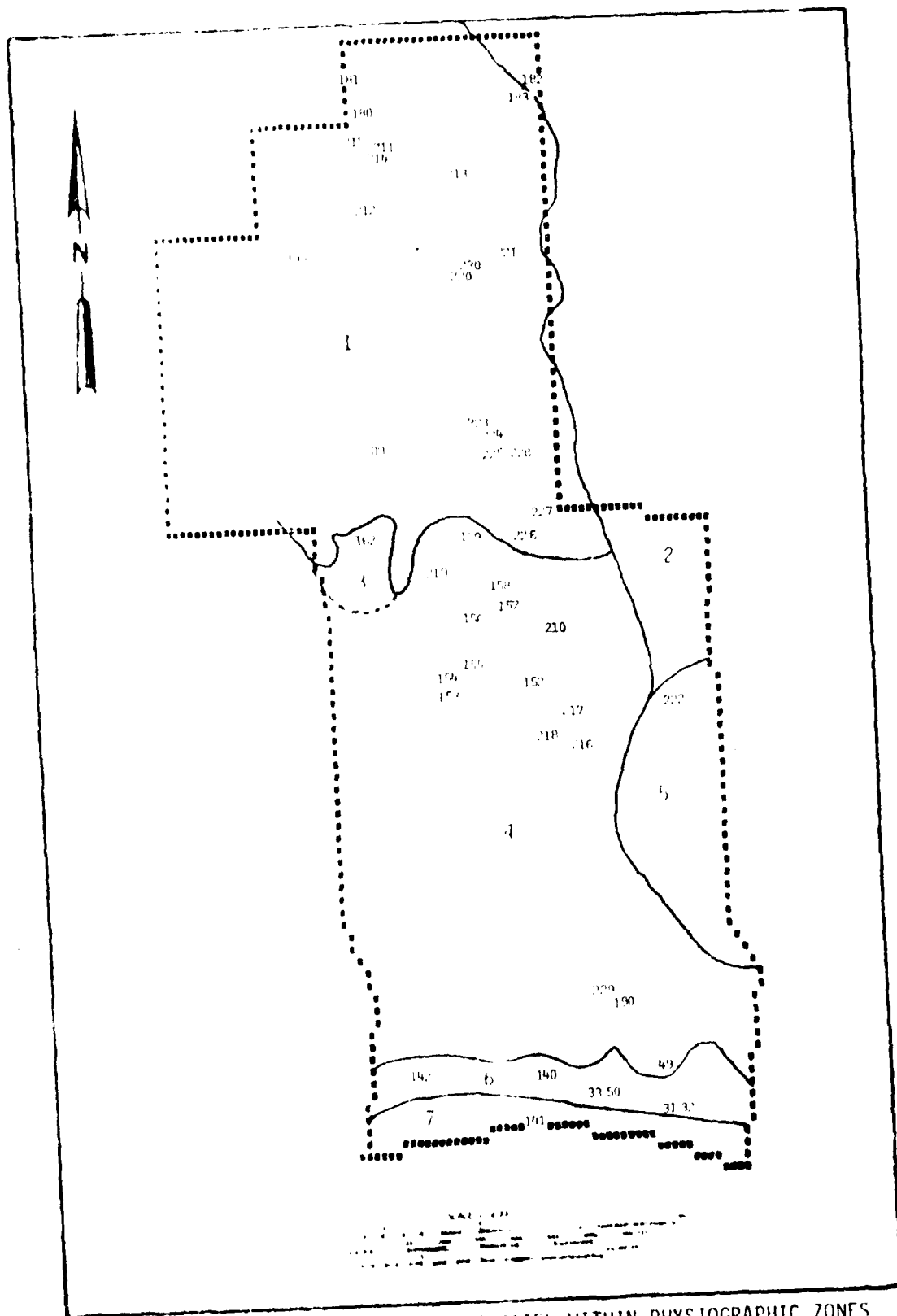


FIGURE 114. MAP SHOWING LOCATION OF SITES WITHIN PHYSIOGRAPHIC ZONES IN PROJECT AREA

ABBREVIATIONS USED IN TABLE 49 AND SUBSEQUENT TABLES.

Abbreviations	Soil Association
Ad	Abernathy silt loam
Al	Allen clay loam
An	Allen fine sandy loam, eroded undulating phase
Cb	Captina and Capshaw silt loams
Ce	Colbert cherty silty clay loam, eroded undulating phase
Cv	Cumberland loam, eroded undulating phase
Df	Decatur/Cumberland silty clay loam
Eg	Egan silty clay loam
Ew	Etowah silt loam, level surface
Ex	Etowah silt loam, undulating surface
Ey	Etowah silty clay loam
Lk	Lindside silty clay loam
Fe	Melvin silty clay loam
Cp	Boltawah silt loam
Se	Sequatchie fine sandy loam
Sf	Sequatchie fine sandy loam, eroded phase
Tb	Talbott cherty silty clay loam, eroded undulating phase
Tc	Talbott cherty, silty clay loam, rolling phase
Physiographic Association	
HSPB	Huntsville Spring Branch Basin
UEHSP	Uplands North and East of Huntsville Spring Branch
USHSB	Uplands South of Huntsville Spring Branch
RCB	Boundary Canal Basin and Adjacent Uplands
BH	Bell Hill
UTR	Upland Tennessee River Terrace
TR	Tennessee River Terrace and Bottomland

TABLE 49. DESCRIPTION OF ON AND OFF SAMPLE SITES WITH REFERENCE TO SITE SIZE AND ENVIRONMENTAL VARIABLES.

ON-SAMPLE	SITES		SOILS	NEAREST WATER	PHYSIOGRAPHIC ASSOCIATION	SQUARE METERS AT EACH SITE	ACRES	HECTARES	TYPE OF SITE
	Known	New							
UNIT 4	211		Ex	20	HSBB	1,800	.44	.18	Prehistoric
	212		Ex	40	HSBB	15,600	3.85	1.56	Prehistoric
	213		Ex	60	HSBB	2,000	.49	.20	Historic
	214		Ex	30	HSBB	1,400	.34	.14	Prehistoric/Historic
	215		Ex	300	HSBB	1,800	.44	.18	Historic
UNIT 9	220		Ey	20	HSBB	3,432	.84	.34	Prehistoric
	221		Ex	75	HSBB	16	.003	.0016	Historic
	230		Ew	20	HSBB	200	.04	.02	Prehistoric
UNIT 14	-0-								
UNIT 19	162		Ey	20	USHSB	4,550	1.11	.45	Prehistoric/Historic
			Ey	100	BCB	1,100	.27	.11	Historic
UNIT 24	152		An	225	BCB	3,900	.96	.39	Prehistoric/Historic
	155		Df	10	BCB	1,600	.14	.06	Prehistoric
	156		Ex	10	BCB	1,500	.37	.15	Prehistoric
	157		Df	100	BCB	1,875	.44	.18	Prehistoric
UNIT 29	210		Df	80	BCB	118,125	29.18	11.81	Prehistoric/Historic
	216		Ew	300	BCB	8,450	2.07	.84	Prehistoric
	217		Op	175	BCB	2,250	.54	.22	Prehistoric
	218		Ex	50	BCB	2,975	.71	.29	Prehistoric
UNIT 30	222		Tc	950	BH	1,925	.46	.19	Historic
UNIT 39	142		Ex	200	TR	11,000	2.71	1.10	Prehistoric
UNIT 44	141		Eg	10	TR	10,500	2.59	1.05	Prehistoric
C.F.-SAMPLE									
UNIT 13	-0-		Ey	50	HSBB	2,800	.69	.28	Prehistoric
UNIT 17	223		Ey	40	HSBB	600	.14	.06	Prehistoric
	224		Ey	40	HSBB	4,000	.98	.40	Prehistoric
	225		Ey	100	HSBB	4,750	1.16	.47	Prehistoric
	227		Cb	50	HSBB	5,000	1.23	.50	Historic
UNIT 20	228		Ey	100	HSBB	9,625	2.37	.96	Prehistoric
	226		Cb	10	BCB	1,900	.46	.19	Prehistoric
	158		Ew	75	BCB	1,800	.19	.08	Prehistoric
UNIT 41	159		Ex	150	TR	1,225	.30	.12	Prehistoric
	49		Tb	100	BCB	3,500	.86	.35	Prehistoric
	190		Df	20	BCB	400	.09	.04	Prehistoric
UNIT 45	31/32		Ey	325	TR	171,000	42.25	17.10	Prehistoric
	33/50		Se/Sf	325	TR	118,125	29.15	11.80	Prehistoric
OTHER SITES RECORDED BY ALEXANDER									
	133		Lk	6	HSBB	13,000	3.21	1.30	Prehistoric
	140		Cv	150	TR	2,200	1.28	.52	Prehistoric
	153		Al	250	BCB	2,125	.51	.21	Prehistoric
	154		Ex	10	BCB	750	.17	.07	Prehistoric
	180		Ew	20	HSBB	5,075	1.23	.50	Prehistoric
	181		Ew	10	HSBB	4,200	1.03	.42	Prehistoric
	182		Ce	10	UEHSB	11,050	2.71	1.10	Prehistoric
	183		Ex	10	HSBB	8,450	2.07	2.07	Prehistoric
OTHER SITE RECORDED BY NWR									
	209		Df	40	HSBB	12,600	3.11	1.26	Prehistoric/Historic

The development of the model was predicated on the validity of association between selected environmental variables and site occurrence within the sample units. The frequency of occurrence of certain variables with regard to cultural resources formed the basis for the predictive model. The frequency distribution for major environmental variables, in relation to both prehistoric and historic sites as well as all sites, are discussed below.

Table 4 presents the descriptive statistics computed for all sample areas, sites for all ratio variables. Elevation and elevation above water are the only two variables that are not characterized by a normal distribution, as expressed by the standard deviations. Only five percent of all sites occur at one hundred seventy-five feet or less above water, and eighty-four per cent at three hundred to four hundred feet elevation above water. Even when all sites are considered, both prehistoric and historic groups, the majority fall into the above categories.

TABLE 4. MEAN AND STANDARD DEVIATIONS FOR RATIO (GRADE) VARIABLES FOR PREHISTORIC (n 16) & HISTORIC (n 52) SITES IN THE SURVEY SAMPLE AREA

VARIABLE	MEAN			STANDARD DEVIATION		
	PREHISTORIC	HISTORIC	TOTAL	PREHISTORIC	HISTORIC	TOTAL
Elevation	171.94	175.67	173.20	2.62	3.71	3.00
EW*	241.25	264.44	126.00	92.12	294.51	194.46
ENW*	437.09	436.11	480.00	419.05	313.28	378.94
EL*	210.25	222.78	268.60	150.80	280.65	216.35
ER*	696.25	603.96	664.00	409.26	343.19	382.06
EP*	1,777.49	6,119.14	5,192.40	2,556.77	2,070.05	2,432.04
EL*	1.00	1.72	2.86	.87	2.80	1.86
EW + ENW	11,755.13	31,779.56	1,912.92	28,705.18	38,704.10	31,887.55

- *EW Distance to Nearest Water
- *ENW Distance to Nearest Water
- *EL Distance to Nearest Stream
- *ER Distance to Nearest Stream
- *EP Distance to Tennessee River
- *EL Elevation Above Water

A large amount of variability is present for all other ratio variables, even when prehistoric and historic groups are examined separately. Prehistoric sites are characterized by a mean distance of eighty-two meters (267 feet) to the nearest water source, as compared to two hundred four meters (649 feet) for historic sites. Distance to nearest stream, two hundred ten meters (230 yards) for prehistoric sites, and three hundred seventy-three (408 yards) meters for historic sites, is substantially larger than that for closest water source. This is due primarily to the values of swamp and lake, under the variable of type of water. As previously mentioned (Chapter 6), there were three marshy lakes present in the Boundary Canal Basin and Adjacent Uplands as late as 1934 which have since been filled in. Inclusion of these lakes provides a better insight into the distribution of prehistoric sites, and decreases the mean distance from the nearest water source.

Distance to next-nearest water is altered little when prehistoric sites are separated from historic sites. The large amount of variability in both groups for this variable is due to the large range in values. The mean distance for both groups, combined, is almost 5,200 meters (5,686 yards).

Site size was measured in square meters, and is based on figures derived during the actual field survey. These figures may differ somewhat from those given in the site descriptions, since the emphasis there was on a measure of maximal artifact density. Site size is characterized by a great degree of variance, no matter what grouping is examined, though the degree of variance is reduced somewhat for prehistoric sites.

Frequencies and percentages for both prehistoric and historic sites for nominal variables -- physiography, topography, type of nearest water, type of next nearest water source, rank of nearest and next-nearest stream, and surface soil are given in Table 51.

With regard to physiographic association, the majority of sites are clearly represented in the Boundary Canal Basin and Adjacent Uplands (44 percent) and Luntville Spring Branch Basin (36 percent). These zones also account for the majority of sites when prehistoric and historic sites are viewed separately.

Topographically, sites in general tend to occur most often on bottomland knolls (44 percent), in proximity to swamps (48 percent), as the closest water source, and are closest to any rank stream as a second water source. The majority of sites (84 percent) occur near Rank 1 and 2 streams when the second-nearest stream is considered. Overall, this distribution tends to remain the same within each of the groups, prehistoric and historic. Both prehistoric (43.8 percent) and historic (44 percent) sites are most often located on bottomland knolls. Type of nearest water source is always a lake or swamp for historic sites; prehistoric sites are located across all types, with seventy-five percent located near to swamp or lake.

TABLE 51. FREQUENCIES OF OCCURRENCE FOR CATEGORICAL
VARIABLES BY PREHISTORIC/HISTORIC CLASSI-
FICATION FOR SAMPLE STUDY 5111.

P H Y S I O G R A P H Y	VARIABLES	PREHISTORIC (n=16)		HISTORIC (n=9)		TOTAL (N=25)	
		f	%	f	%	f	%
T O P O G R A P H Y	--Bell Hill	0	0.0	1	11.1	1	4.0
	--HSB Basin	5	31.3	4	44.4	9	36.0
	--Boundary Canal Basin and Adjacent Uplands	8	50.0	3	33.3	11	44.0
	--Uplands South of HSB Basin	1	6.3	1	11.1	2	8.0
	--Uplands North and East of HSB Basin	1	6.3	0	0.0	1	4.0
	--Tennessee River Terrace & Bottomlands	1	6.3	0	0.0	1	4.0
N. W A T E R	--Ridgecrest	4	25.0	2	22.2	6	24.0
	--Lower Ridge Slope	2	12.5	2	22.2	4	16.0
	--Ridge Nose	1	12.5	1	11.1	3	12.0
	--River Terrace	1	6.3	0	0.0	1	4.0
	--Bottomland Knoll	7	43.8	4	44.4	11	44.0
	--Stream - Rank 1	1	6.3	0	0.0	1	4.0
N E X T N. W A T E R	--Stream - Rank 6	1	6.3	0	0.0	1	4.0
	--Lake - Rank 2	2	12.5	0	0.0	2	8.0
	--Lake - Rank 3	6	37.5	3	33.3	9	36.0
	--Swamp	6	37.5	6	66.6	12	48.0
	--Stream - Rank 1	3	18.8	3	33.3	6	24.0
	--Stream - Rank 2	5	31.3	2	22.2	7	28.0
N. S T R E A M	--Stream - Rank 4	3	18.8	3	33.3	6	24.0
	--Lake - Rank 2	1	6.3	0	0.0	1	4.0
	--Lake - Rank 3	1	6.3	0	0.0	1	4.0
	--Swamp	3	18.8	1	11.1	4	16.0
	--Rank 1	4	25.0	3	33.3	7	28.0
	--Rank 2	2	12.5	0	0.0	2	8.0
N.	--Rank 3	6	37.5	3	33.3	9	36.0
	--Rank 4	3	18.8	3	33.3	6	24.0
	--Rank 6	1	6.3	0	0.0	1	4.0
N.							

E R	Lake - Rank 1 Swamp	6	37.5	3	66.6	12	48.6
N E X T N. W A T E R	--Stream - Rank 1	3	18.8	3	33.3	6	24.0
	--Stream - Rank 2	5	31.3	2	22.2	7	28.0
	--Stream - Rank 4	3	18.8	3	33.3	6	24.0
	--Lake - Rank 2	1	6.3	0	0.0	1	4.0
	--Lake - Rank 3	1	6.3	0	0.0	1	4.0
	--Swamp	3	18.8	1	11.1	4	16.0
N. S T R E A M	--Rank 1	4	25.0	3	33.3	7	28.0
	--Rank 2	2	12.5	0	0.0	2	8.0
	--Rank 3	6	37.5	3	33.3	9	36.0
	--Rank 4	3	18.8	3	33.3	6	24.0
	--Rank 6	1	6.3	0	0.0	1	4.0
N. N. S T R.	--Rank 1	5	31.3	4	44.1	9	36.0
	--Rank 2	7	43.8	5	55.6	12	48.0
	--Rank 3	4	25.0	0	0.0	4	16.0
S U R F A C E S O I L	--Talbot Cherty Silty Clay Loam	0	0.0	1	11.1	1	4.0
	--Etowah Silty Loam	8	50.0	4	44.4	12	48.0
	--Etowah Silty Clay Loam	2	12.5	2	22.2	4	16.0
	--Ooltewah Silty Loam	1	6.3	0	0.0	1	4.0
	--Decatur & Cumberland Silty Clay Loam	3	18.8	1	11.1	4	16.0
	--Egmont Silty Clay Loam	1	6.3	0	0.0	1	4.0
	--Allen Fine Sandy Loam	1	6.3	1	11.1	2	8.0

Although topographic association is often a good predictor of site location, landform type does not appear to be critical in the Redstone Project area. Calculation of the mean elevation above water for pre-historic sites indicates a range from 1.75 meters (5.7 feet) above water for ridge nose to 3.13 meters (10.2 feet) above water for ridge crest, with all other landform types falling somewhere in between. It appears that elevation above water or higher ground was being elected for more so than any particular landform type. This selection for higher elevation regardless of landform type is characteristic throughout the entire project area.

The data suggest that rather than topographic association, it is a distance of less than two hundred meters to the nearest source of water, type of water, and soil association, that are significant variables in both prehistoric and historic site location. Eighty percent of all sites are less than or equal to, two hundred meters away from water. This percentage increases slightly for prehistoric sites (87.5 percent) but decreases (66.7 percent) for historic sites. Of these sites, seventy-five percent occur next to either a lake or a swamp. In conjunction with these two variables, Etowah and Decatur-Cumberland soils tend to occur adjacent to swamp areas or to the lake beds in the Boundary Canal Basin. Consequently, soil association in relation to distance to nearest water acts as a good predictor of site location.

There are 149 named soil types in Madison County, Alabama (Swenson et al. 1957), but only 21 occur in the nine sample survey units (Table 52). Thirteen of the soil types have a very limited distribution, each occupying less than one percent of the total acreage. Of the 18 soils that individually comprise more than one percent of the survey area, archaeological sites occur on only eight. In terms of areal extent, all of the sites occur on soil types which together comprise 25.8 percent of the acreage in the survey units. In other words, 100 percent of the sites occur on soils that encompass one-fourth of the survey area. Thus, by simply delineating soil types on which sites occur, it is possible to isolate 75 percent of the survey area as being low probability areas for sites.

The distribution of sites can be refined even further. Most of the sites located in the survey units occur on only four of the soils. Seventeen of the 21 sites (80.9%) reported in the survey area occur on either Decatur/Cumberland silty clay loam (Df); Etowah silt loam, level (Ew) or undulating (Ex) phases; or Etowah silty clay loam (Ey). This distribution takes on added significance when one considers that the soils comprise only 16.25 percent of the land surface.

If site selection was not based on specific preferences for soil, but was random, we would expect the number of sites located on each soil type to vary in proportion to the total acreage comprised by each soil. In this case, we would expect three or four times as many sites to occur on Melvin silty clay loam (Me), which comprises 20.65 percent of the sample survey units, than on Ex, which encompasses only 5.74

TABLE 52. SOIL TYPES OCCURRING IN THE SAMPLE SURVEY AREA AND FREQUENCY OF ARCHAEOLOGICAL SITES.

Soil Symbol	Soil Name	% of Acreage	Number of Archaeological Sites	% of Archaeological Sites
Df	Decatur and Cumberland silty clay loam, eroded undulating phase	5.15%	3	14.3%
Ew	Etowah silt loam, level phase	1.09	2	9.5
Ex	Etowah silt loam, undulating phase	5.74	9	42.9
Ey	Etowah silty clay loam, eroded undulating phase	4.22	3	14.3
An	Allen fine sandy loam	4.39	1	4.8
Eg	Egan silty clay loam	1.01	1	4.8
Op	Ooltewah silt loam	1.35	1	4.8
Tc	Talbott cherty silt loam, eroded rolling phase	2.87	1	4.8
Soils comprising 1.0% of total acreage but containing no sites				
Ad	Abernathy silt loam	4.39	0	0.0
Al	Allen clay loam	1.18	0	0.0
Cb	Captina and Capshaw silt loams	1.26	0	0.0
Ce	Colbert cherty silty clay loam, eroded undulating phase	1.18	0	0.0
Cf	Colbert cherty silty clay loam, eroded rolling phase	1.26	0	0.0
Me	Melvin silty clay loam	20.65	0	0.0
Ro	Robertsville silt loam	10.05	0	0.0
Rs	Rockland limestone, steep	2.87	0	0.0
Ta	Taft silt loam	1.09	0	0.0
Tk	Talbott-Colbert cherty silty clay loam	1.09	0	0.0
Water		4.64	0	0.0
Dis-turbed		18.15	0	0.0
Soils which comprise less than 1.0% of total acreage				
Ab	Abernathy cherty silt loam	0.25%	0	0.0
Ac	Abernathy fine sandy loam	0.25	0	0.0
Cc	Captina and Capshaw silt loam, undulating phase	0.16	0	0.0
Db	Decatur and Cumberland silt loam, undulating phase	0.33	0	0.0
Dd	Decatur and Cumberland silty clay loam	0.67	0	0.0
Dg	Decatur and Cumberland silty clay loam	0.84	0	0.0
Hj	Hermitage cherty silt loam	0.76	0	0.0
Lk	Linside silty clay loam	0.84	0	0.0
Pa	Pearman loam	0.92	0	0.0
Rr	Rockland limestone, hilly	0.76	0	0.0
Tb	Talbott cherty silty clay loam, eroded undulating phase	0.08	0	0.0
Tg	Talbott silty clay loam	0.42	0	0.0
Tu	Tupelo silt loam	0.25	0	0.0

percent of the survey area. Also, we would expect about the same number of sites to occur on Ly (4.22% of land surface) as occur on Abernathy silt loam (Ad)(4.39% of land surface). In both cases, the data stand in strong contrast to the distribution one would expect if soils were not related to site selection. No sites occur on Me soils, whereas nearly half of the sites (9 of 21, or 42.8%) occur on zones of Ex. This is true even though the Etowah soils cover an area only about one-fourth as large as the Me zone. Similarly, in the two zones of almost equal size, no sites occur on the Ad soils (4.39% of land surface), whereas three sites (14.28% of all sites) occur on Ly soils. With such strong associations, it is simply not necessary to present a series of statistical tests of association to confirm the obvious. There is an extremely strong relationship between soil type and the presence of archaeological sites.

Although 80.9 percent of the sites located in the survey area occur on Df, Lw, Ex, and Ly soils, one site each was found on areas of Allen fine sandy loam (An), eroded undulating phase; Egan silty clay loam (Eg); Holtewah silt loam (Op); and Talbott cherty silty clay loam (Tc), eroded rolling phase. The area encompassed by these soils ranges from 1.01 percent for Eg to 4.39 percent for An.

Based on the survey data, it is possible to rank soils in terms of the potential for sites to occur on each. Clearly, Lw, Ex, Ly, and Df soils constitute high probability areas for site locations. The second group of soils, An, Eg, Op, and Tc, were not selected for as consistently as the former group. These zones must be considered as medium probability for site location. For soils on which no sites are located, we rate the zone as low probability if the total acreage encompassed by the soil equals or exceeds one percent of the total acreage of the survey area. If the soil covers less than one percent of the survey area, we consider its representation too low to allow prediction. In the case of the sample survey results, 13 soils occur in such small areas that no predictions as to site probability are attempted (Table 52; see folio-back cover).

In addition to soil type, distance from water is quite significant in terms of site location. Of the 21 sites located by the survey, 17 or 80.9 percent are situated within 200 meters (656 feet) of the nearest source of water, and only one site is located more than 400 meters (1,312 feet) from water. Since this variable has obvious predictive value, we can refine the model by combining the distance from the nearest water source with soil type. Table 53 presents a nine-by-three celled contingency table indicating for site locations the relationship between soils and distance from water.

Table 53. CONTINGENCY TABLE SHOWING FREQUENCY OF ARCHAEOLOGICAL SITES IN RELATION TO SOIL TYPE AND DISTANCE FROM NEAREST WATER SOURCES. Figures are for sites from sample survey only.

		Distance from nearest water source			Totals
		0-200m	201-400m	400+m	
Soil type	Df	3	0	0	3
	Iw	1	1	0	2
	Ix	8	1	0	9
	Ey	3	0	0	3
	An	0	1	0	1
	Eg	1	0	0	1
	Op	1	0	0	1
	Tc	0	0	1	1
Totals		17	3	1	21

Combining the two variables, soil and distance from nearest water, we can differentiate high, medium, and low probability zones (Table 54).

Table 54. PROBABILITY ZONES BASED ON SOIL TYPES AND DISTANCE FROM NEAREST WATER.

		Soil type	Distance from nearest water source	# of Sites	% of Total
Probability zone	High	Iw, Ix, Ey, Df	0-200m	15	71.4
		Iw, Ix, Ey, Df	201-400m	2	9.5
	Medium	An, Op, Tc, Eg	0-400m	3	14.3
		Iw, Ix, Ey, Df	400+m	0	0.0
	Low	An, Op, Tc, Eg	400+m	1	4.8
		Ad, Al, Ch, Ce, Cf, He, Ro, Rs, Ia, Tk	Any distance	0	0.0

High probability locations account for 71.4 percent of the sites reported from the sample survey area. In contrast, 23.8 percent of the sites occur in areas ranked as medium probability, while only one site (4.7%) is situated in a low probability zone. That site is 1Mal22, a recent historic house site located on Bell Hill. Its situation is doubtless related to the fact that a location in close proximity to a stream, lake, spring, or swamp loses its importance when wells or cisterns are available.

While the predictive model has been carefully developed on the basis of a statistically valid sample of the study area, it requires testing by considering the data from other sites in the study corridor. In this regard, two additional steps can be taken in the development of the predictive model. First is the addition of sites in the off sample survey units and second is the inclusion of sites located in the corridor, but not within any of the off-or on-sample units.

Our survey was expanded from the nine sample units to include survey sections 13 and 17. In addition to these two units, we are reasonably assured that our investigations, combined with the earlier work of Day (n.d.a; n.d.b; n.d.c; n.d.d; n.d.e) and Alexander (1979) have resulted in the discovery of all sites located in survey sections 20, 41, and 45. Since these five units have been fully examined, they are comparable, in terms of site recovery, to our sample survey units. It is appropriate, therefore, to incorporate these data into our predictive model.

Thirteen sites are located in these five survey units. Their distribution, summarized in Table 55, differs slightly from the sites in the sample survey. Two sites are situated on Captina and Capshaw silt loams (Cb), one is located on Sequatchie fine sandy loam (Se) and Sequatchie fine sandy loam eroded phase (Sf), and one is situated on Talbott cherty, silty clay loam, eroded undulating phase (Tb). None of these soils contained archaeological sites in the initial sample survey.

The difference between the sample survey and the totals from the five additional units reflect significant variation in site frequencies

Table 55. CONTINGENCY TABLE SHOWING FREQUENCY OF ARCHAEOLOGICAL SITES IN RELATION TO SOIL AND DISTANCE FROM NEAREST WATER SOURCE. Figures are for survey units 13, 17, 20, 41, and 45 only.

		Distance from Nearest Water Source			Totals
		0-200m	200-400m	400+m	
5011	Fy	5	1	0	6
	Lw	1	0	0	1
	Cb	2	0	0	2
	Se/Sf	0	1	0	1
	Lx	1	0	0	1
	Tb	1	0	0	1
	Df	1	0	0	1
Totals		11	2	0	13

within the corridor, and appear to relate to physiographic location. Specifically, the Tennessee River terraces, both recent and relict, form a distinct zone which is marked by different soil types and by very intense prehistoric settlement. Because of these important differences, the delineation of high and low probability zones along the river must be based on a distinct set of criteria.

Along the river, a different group of soils were favored for settlement. These include Egan silty clay loam (Eg) and Sequatchie fine sandy loam (Se/St). In addition to soils, the distance from the nearest water source varies somewhat and requires a slightly different valuation. These changes are incorporated into a revised site locational model which differentiates between the two principal settlement zones, the Tennessee River terraces and the interior (Table 56).

Table 56. PROBABILITY RANKINGS FOR ALL COMBINATIONS OF SOIL AND DISTANCE FROM WATER. Figures are for sites located in sample survey units plus units 13, 17, 20, 41, and 45.

	Probability Ranking	Soil type	Distance from Nearest Water Source	# of Sites	% of total in Zone
	High	Iw, Lx, Ey, Df	0-200m	22	75.8
		Iw, Lx, Ey, Df	200-400m	2	6.8
	Medium	An, Op, Tc, Cb	0-400m	4	13.7
		Iw, Lx, Ey, Df	400+m	0	0.0
	Low	An, Op, Tc, Cb	400+m	1	3.4
		Ad, Al, Cb, Ce, Cf, Me, Ro, Rs, Ta, Tk	Any distance	0	0.0
	High	Eg, Ex, Ey, Se, Sf, Tb	0-500m	5	100.0
	Low	Me, Ro	Any distance	0	0.0

The revised predictive model remains essentially unchanged from that developed on the basis of the sample survey. Seventy-five percent of all sites in the interior occur in the areas ranked high probability, whereas 20.5 percent of the sites occur in medium probability zones. The major difference between the initial and the revised model concerns the distinction of the Tennessee River settlement zone. This addition to the model scores as high probability a number of soil types that do not rank high in the interior. This difference, as rated above, reflects the very dense settlement in the river zone.

As mentioned previously, there is one more step that can be taken in the development of the predictive model, the inclusion of all sites found outside the 100-ft and 100-sample survey units. A total of 43 sites have been reported in the project corridor. Of that number, 37 are located in the interior zone, while six are in the Tennessee River zone. In the interior, 27 (73.0%) occur in high probability zones. This occurrence of sites in high probability zones duplicates almost exactly the percentage of sites in high probability zones based on the sample survey (73.1%).

In the entire project corridor, sites occur on three soil types that are not represented in the sample survey. One site each is located on Allen clay loam (Ar), Colbert cherty silty clay loam (Cc), and Lindsay silty clay loam (Lk). If we incorporate these soils into the model, the probability zones appear as shown on Table 57.

TABLE 57. PROBABILITY RANKINGS FOR ALL COMBINATIONS OF SOIL AND DISTANCE FROM WATER. Figures are for all sites in the study corridor.

Probability Ranking	Soil type	Distance from nearest water source	# of Sites	% of total in Zone
High	Aw, Ex, Ey, Df	0-200m	27	73.0
	Aw, Ex, Ey, Df	200-400m	2	5.4
Medium	Al, An, Cb, Ce, Ek, Ep, Ic, Cv	0-400m	7	18.9
	Aw, Ex, Ey, Df	400+m	0	0.0
	Al, An, Cb, Ce, Ek, Ep, Ic, Cv	400+m	1	2.7
Low	Ad, Aw, Cu, Ee, Ro, Es,	Any distance	0	0.0
High	Cu, Eg, Ex, Ey, Ek, Se, Sf, Tb	0-500m	6	100.0
Low	Ne, Io, Pr	Any distance	0	0.0

Combining high probability zones with medium probability zones, we can account for 92.3 percent of the sites. Seventy-three percent of the sites in the entire study corridor, occur in high probability areas. Although three-fourths of the sites occur here, these areas comprise only slightly more than 18 percent of the land surface.

Of the two variables incorporated into our predictive model, soils seem to be the most reliable predictor of site location. The reason for this is not difficult to explain. The soil map is extremely accurate, and, therefore, the locational data are extremely accurate. But most important, the soils designations are very sensitive to minor variation in relief and drainage. Thus, the soils data are indicative not only of the composition of the soil, but reflect the presence of slight elevations and depressions. Also, the soils data accurately delineate the terraces of the Tennessee River, and differentiate them from other landforms in the interior. For these reasons, we have selected soils as the primary variable upon which to base our locational model.

The foregoing discussion has provided a general framework within which to view the distributional nature of the data and to determine which variable categories accounted for the greatest frequency of sites. This information, when incorporated into the predictive model, reflected the outstanding importance, first of soil, and then distance to nearest water, in the prediction of prehistoric site location. However, a further breakdown of sites is sought in which groups of prehistoric sites are interpretable within a framework that can be correlated to archaeological concepts such as type of site, chronology, and settlement trends.

Chronology and Settlement: Prehistoric Occupation

The combined results of our work, the WPA investigations, and Alexander's preliminary survey indicate prehistoric occupation in the project area from the Paleo-Indian period through the Mississippian period. In terms of types of sites represented, the study corridor hosts a wide variety, including base camps, limited activity stations, villages, and mound and village complexes. Certain variations, however, were observed in the frequency and distribution of the different site types.

In northern Alabama, the banks of the Tennessee River were heavily settled in prehistoric times. The WPA survey of the portion of the river affected by the Wheeler Dam revealed a long sequence of occupation and a very dense distribution of sites (Webb 1939). As shown by our work along the Tennessee River and in the interior, settlement along the river differed substantially from that along the minor drainages to the north (Figure 115). Sites located on the young terraces of the Tennessee River or on relict terraces near the river tend to be quite large in contrast to the generally smaller sites along Huntsville Spring Branch Basin or in the Boundary Canal Basin. Also, mounds are concentrated along the river.

One of the major differences between settlement along the river and that in other portions of the study corridor is in the intensity of occupation. Table 54 shows the total acreage surveyed in each physiographic province and the corresponding acreage encompassed by

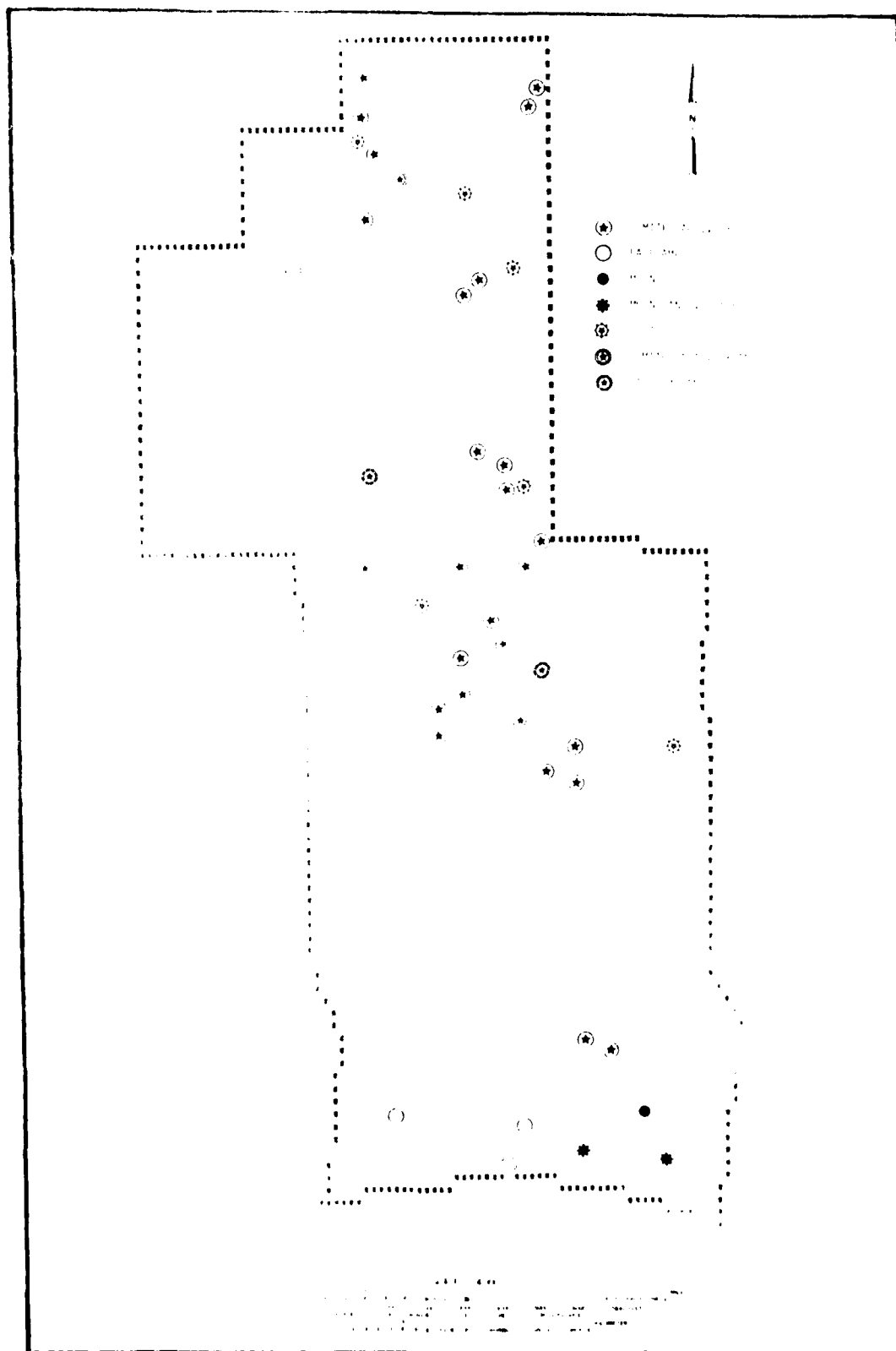


FIGURE 115 MAP SHOWING DISTRIBUTION OF SITES BY SITE CLASSIFICATION

Table 6.1. SUMMARY OF ACREAGE SURVEYED IN EACH
PHYSIOGRAPHIC ZONE AND THE TOTAL
ACREAGE ENCOMPASSED BY ARCHAEOLOGICAL
SITES WITHIN EACH ZONE.

Physiographic Zone (See Fig. 49 for abbreviations)	Survey Acreage*	Acreage Encompassed By Sites	% of Total Acreage Encompassed By Sites
HSPF	854.4	13.08	1.53%
BCF	491.2	34.89	7.10%
[TERR.]	94.4	1.12	1.18%
RI	217.8	.27	0.12%
DEH.	3.7	0.00	0.00%
IN & IN			
IN	332.8	78.03	23.4%

*Based on lettered figures, Chapter 6, this report.

archaeological sites within each province. It is clear that archaeological sites cover a far greater portion of the Tennessee River terraces, and uplands north of the Tennessee River (comprised of relict river terraces) than is true of other physiographic zones. Sites cover almost one-fourth of the total land surface encompassed by the river terraces (23.4%). In contrast, sites encompass only 13.08 acres or 1.53 percent of the land surface in the Huntsville Spring Branch basin. Thus, a far greater percentage of the Tennessee River terraces is marked by the presence of sites than is true for the interior zones.

Although differences in settlement, in terms of physiography, are rather dramatic, we anticipated that the sites would exhibit similarities in relation to other variables and that these similarities might relate to chronological shifts. An approach to providing a better interpretive framework is provided by a methodology generally referred to as cluster analysis. Two types of clustering analyses were used to cluster sites: the average linkage method and the k-means procedure. Programs for these two techniques are found in the Biomedical Computer Programs Package (Dixon and Brown 1979). Both techniques are discussed below, followed by a presentation of results.

The variables used as measurements were the same in both procedures, and included the following: elevation, site size, distance to the Tennessee River, distance to both first and second water sources, as well as to both nearest and next-nearest streams, and elevation above water. All measurements are recorded in meters. Prior to both clustering analyses, the data were standardized to z-scores. This is achieved by the calculation of the mean and standard deviation for each variable. Each value of each variable is expressed as a deviation from the mean. This reduces the possibility that variables

having very large standard deviations will be more heavily weighted than variables with small deviations (Engleman 1979a:637). A large amount of variance, or large standard deviation, does not necessarily imply that a variable provides a greater contribution to, or differentiation among clusters.

Cluster analysis is a set of classificatory techniques which seeks to organize data, whether they be cases or variables, in such a way that some sort of patterning becomes apparent. This patterning takes the form of a set of clusters, which are composed of cases that are "similar" or not, all variables in a general way. Ideally, each cluster is isolated from all others. Essentially, cluster analysis groups data on the basis of given variables in such a way that it presents not only a more parsimonious description of the data, but also either generates new hypotheses, or provides a better understanding of expectations already held about the data set. Cluster analysis does not provide any sort of measure for the testing of significance; it is more of an exploratory tool. Under certain conditions, as in the k-means procedure, values computed for significance levels should not exceed the criterion measure that clusters must meet, since the procedure seeks an optimal partitioning of the data through a process of reallocation of cases.

Clusters are characterized by an overall similarity of cases. Similarity or resemblance of cases is expressed by means of coefficients of similarity, which range between one and zero, or by coefficients of dissimilarity (distance), which range from zero to an predefined value (Nathan and Sokal 1973). Distance measures are used in both procedures noted, since all measurements are ratio.

Cluster analysis as a set of techniques incorporates many different procedures. In general, they are either hierarchical or non-hierarchical. In the resultant groups, or clusters, are either overlapping or non-overlapping. Cluster algorithms also operate via both iterative or non-iterative strategies and final solutions are the result, either iterative or iterative) or direct procedures. While hierarchical methods may be characterized either by overlapping or non-overlapping clusters, non-hierarchical methods produce only non-overlapping clusters. Clusters which are overlapping are dependent on all preceding clusters in the formation of later ones. This is not true for non-overlapping clusters, which may be interpreted on an individual basis without reference to any other group. The latter are also defined by a distance criterion between the clusters, which makes distinction between clusters easier to handle on an interpretive basis (Nathan and Sokal 1973; Anderberg 1973).

Agglomerative and divisive strategies are initiated in much the same way. Both strategies determine all possible pairwise combinations between cases, joining the most similar pair to form a cluster. Then the similarity or distance value of all remaining cases is recalculated to seek the best amalgamation between existing clusters and new clusters (Anderberg 1973:133). The difference

between these two techniques lies in the overall result. A divisive strategy produces a continuous hierarchy in which clusters are sequentially broken down into smaller cluster groups. An agglomerative strategy operates in the opposite manner, forming links between closely related cases, then between clusters, until all are ultimately fused to form one grand cluster (Doran and Hodson 1975:160). These relationships are usually schematically presented in a tree diagram, often referred to as a dendrogram.

Direct and indirect solutions can produce very different results, even when the same data set is clustered. Direct solutions produce a continuous structure in a set of data, in that all clusters are dependent on one another because they are linked, causing members to be locked into the cluster in which they were initially placed (Doran and Hodson 1975:165). Direct solutions are a characteristic of agglomerative methods and of divisive methods, when the latter are fused in conjunction with hierarchical techniques. Because of the inability of a direct solution to move a case out of one existing cluster into another, hierarchical cluster analysis will clearly represent similarities among the early links, but the relationships between major groups can be distorted (Sneath and Sokal 1973:247). An indirect solution is used only with divisive methods to produce non-hierarchical results. It partitions cases into an initial set of clusters, and then cluster memberships are altered by an iterative or reallocation process, so as to seek a better partitioning of the data.

In addition to all the features discussed above, clusters may also be monothetic or polythetic. Monothetic clusters are obtained through a divisive process in which clusters are created at each stage on the basis of a single, dichotomous attribute, which is then eliminated from the formation of each succeeding cluster. A polythetic cluster is one in which all cases share certain features, but may not always agree in any one feature (Doran and Hodson 1975:160, 177-178). This form of classification is not dependent on a single diagnostic attribute. A polythetic technique has been employed in both analyses, since the variables used are ratio measurements, and it is felt that it is more advantageous to employ all variables at each step as definitive measures of similarity for clusters.

Average Linkage Cluster Analysis

The results of the first clustering technique presented below were achieved by an algorithm referred to as average distance or average linkage. This technique belongs to the set of hierarchical, agglomerative methods, by which groups are arrived at through a direct solution, and are overlapping, since all groups are dependent on the formation of earlier ones. Specifically, it operates by computing the Euclidean distance, "the square root of the sum of squares of the difference between the values of the variables for two cases" (Ingelman 1979:1033). Each site is considered as an individual cluster. Then, in a stepwise progression, clusters with the shortest distance between them are combined or amalgamated, and considered to

to one cluster. This process continues until all clusters are linked in some manner, no matter how great the separating distance (Engleman 1979a:633). The average linkage algorithm is not dependent on extreme values for the definition of a cluster. Rather, a cluster is characterized by the average of all links within it (Anderberg 1973: 139-140). When a new cluster is formed (whether it be one unit or several, forming an already extant cluster), there is a computation of distance made on the basis of the arithmetic average of the distance coefficient between the candidate cluster up for admission, and members of the already existing cluster. The result determines whether or not a fusion will take place at that step, or at some later point (Anderberg 1973:139-140).

The average linkage cluster analysis did not produce very satisfactory results. This is because particular sites became locked into clusters at too early a stage. It is also due to a certain amount of distortion because the averaging process does not permit an extant cluster to be split if a member site is found to be more similar to a cluster other than the one in which it is placed. Also, sites that join a cluster late will tend to have less influence on the structure of the cluster than those sites which enter early.

Although the results of this analysis indicate that some structure or patterning is present, none of these groups represent tightly formed clusters that are easily interpretable in terms of the environmental and archaeological data. Certainly, there will always be cases that cannot be easily, if at all, placed into a group during a clustering process, but much of the problem here is probably due to the lack of a reallocation process. The k-means cluster analysis permits such reallocation so that the differentiations and patterning that were difficult to clarify with the average linkage procedure become more apparent.

k-means Cluster Analysis

The second clustering algorithm applied was the k-means procedure. This is a non-hierarchical method which partitions sites into clusters using the Euclidean distance measure between sites and centers of clusters. As with the other algorithm, each site is considered to be a cluster. A number of clusters is requested and at each step a previous cluster is split into two. Cases are reallocated into the cluster whose center they are closest when the desired number of clusters has been reached (Engleman 1979b:648.1). The reallocation process helps to decrease some of the distortion and arbitrariness found in the average linkage procedure.

The k-means clustering process is initiated by creating a series of cluster centers. The first center mean is the overall sample mean. A series of k-clusters (the number requested) are calculated and then each site is assigned to a cluster and new centers are recalculated for an examination of remaining sites. The center or "centroid" is the mean value of all variables for all sites in a cluster (Doran and Hodson 1975:130).

The results of this cluster analysis are given below in Table 59 in which cluster means and standard deviations are given, as well as the grand mean for all variables. Several clusters were requested, ranging from two to seven. The number of clusters that can be requested is one less than the number of variables used to cluster. The most meaningful analysis was produced with the number of clusters being equal to five. Distances from centers of clusters to cases were more reduced than for any other analysis. Table 59 also presents information not included within the cluster analysis pertaining to qualitative data such as prehistoric site type, soil type, type of nearest water and cultural affiliation. This was done in order to examine whether the clusters produced by the analysis were interpretable in terms of these qualitative variables. Several of the sites are multicomponent; however, they were entered into the cluster analysis as one object because it is not possible to distinguish the various components of the sites on any but a qualitative level. For example, the variables included in the analysis are the same for all components; with the exception of size which cannot be ascertained. If an index variable for multicomponent sites was introduced, given the small sample of sites, serious bias could be introduced to the analysis.

Three sites, 1Ma31/32 (Cluster 1), 1Ma33/50 and 1Ma210 (Cluster 3) could not be optimally grouped with any other cluster. Sites 1Ma33/50 and 1Ma210 clustered because of their almost identical measurements. Throughout all clusterings, whether it be two or seven, 1Ma31/32 was always extracted to form a single group, obviously due to its large size. Actually, 1Ma31/32 and 1Ma33/50 should be grouped together. Besides representing the largest sites in the project area, these sites span a period from Early Archaic through Late Archaic and evidence of occupation is also present during the Late Woodland and Mississippian periods. Site 1Ma31/32 also exhibited evidence of Paleo-Indian activity. Site 1Ma210, however, revealed an occupational sequence that only extended through the Middle Woodland period. As with any clustering algorithm, a global optimum will never be found. In this case, a local optimum is sought and a close examination of the resulting clusters should help to point out sites that are either single outliers or should be included within another cluster.

Cluster 2 is composed of a series of sites that were broken down in further analyses requesting six and seven clusters. All other sites were clustered in exactly the same manner as they appeared in the cluster analysis requesting five groups. Overall, site size is much greater than for Clusters 4 and 5; but not as great as for the outliers mentioned above. The large standard deviations for all variables indicates much less homogeneity than depicted in the other groups. Figure 116 graphically illustrates the clusters that were produced. It is clear that Cluster 2 is not as cohesive as Clusters 4 and 5. The analysis requesting seven clusters divided these nine sites into three groups: 1) sites 133, 209, 212; 2) sites 141, 142, 216; and 3) sites 182, 183, 226. In general, while these sites could be split into the above three groups, such a division does not really

ABBREVIATIONS FOR TABLE 59.

*Site Type

MV Mound/village
BC Base camp
LS Limited activity
IM Isolated mound

**DIR Distance to Tennessee River

DNE Distance to nearest water

DNNW Distance to next nearest water

DNS Distance to nearest stream

DNNS Distance to next nearest stream

***Chronology

P Paleo-Indian

EA Early Archaic

MA Middle Archaic

LA Late Archaic

EW Early Woodland

MW Middle Woodland

LW Late Woodland

MS Mississippian

181	LA	4,200	9,100	10	150	150	800	Ew	Swamp	No data
211	LA	1,800	8,500	20	400	400	950	Ex	Swamp	No data
214	LA	1,400	8,300	30	400	400	950	Ex	Swamp	No data
220	LA	3,432	7,225	20	400	400	500	Ey	Swamp	LA
223	LA	2,800	6,000	50	200	200	250	Ey	Swamp	P MA LA EW LW
224	LA	600	5,925	50	200	200	300	Ey	Swamp	No data
225	LA	4,000	5,800	40	100	100	400	Ey	Swamp	EA MA
227	LA	4,750	5,400	100	100	100	200	Cb	Str-1	EW
230	LA	200	7,300	20	375	375	500	Ew	Swamp	No data
Group X		2,982	7,057	34	270	270	514			
S.D.		1,733	1,443	25	123	123	271			

CLUSTER 5

SITE NO.	SITE TYPE	SIZE	DTR**	DNW**	DNW**	DNS**	DNNS**	SOIL	NEAREST WATER	CHRONOLOGY
152	LA	3,900	3,650	225	225	225	450	An	Lake	MA LA
153	LA	2,125	3,600	250	650	250	650	Al	Lake	No data
154	LA	750	3,900	10	600	10	700	Ex	Lake	No data
155	LA	600	3,950	10	400	10	450	Df	Lake	LA
156	LA	1,500	4,200	10	450	10	450	Ex	Lake	MA LA EW MW
157	LA	1,875	4,300	100	100	100	100	Df	Lake	LA
190	LA	3,500	1,100	100	150	100	400	Df	Str-1	LW
217	LA	2,250	3,550	175	1,050	175	1,050	Op	Lake	No data
218	LA	2,975	3,300	50	1,300	50	1,300	Ex	Lake	LA
229	LA	400	1,125	20	100	100	450	Ey	Swamp	No data
49	IM	1,225	700	150	425	150	425	Tb	Str-1	MW
140	BC	5,200	375	150	375	375	625	Cy	Swamp	MA LA MW LW
158	LA	1,900	4,750	10	100	10	100	Ew	Lake	MA LA
159	LA	800	5,150	75	100	100	400	Ex	Swamp	No data
Group X		2,071	3,118	95	430	118	539			
S.D.		1,399	1,589	83	370	108	323			
Grand X		15,387	4,718	85	353	184	531			

add to any understanding of the group in general. The primary difference between this group and Clusters 4 and 5 is not only size ($\bar{x}=11,142$), but that the majority (55%) of the sites exhibit evidence of woodland occupation. Distance to the Tennessee River was not an important factor as for those sites in Cluster 5. All but two sites are located more than 3,200 meters away from the Tennessee River, and four of the six basecamps are in this cluster.

Cluster 4 is composed of 11 sites, all of which were originally defined as limited activity sites. Overall, they represent a fairly tight cluster and are characterized by a small site size ($\bar{x}=2,982$), greater distances from the Tennessee River than any other group, but the smallest mean distance to the nearest source of water and next nearest water. Distance to the nearest stream appears to be greater than for all other groups and there is not that much of a decrease from next nearest stream to warrant any real examination. Besides the differences in the mean of distance to water measures, there are several interesting features when the variables initial site type, soil type and distance to nearest water are considered. The standard deviation and variance are the lowest reported for all clusters, thereby indicating a high degree of homogeneity. It is not only composed of all sites that were originally classified activity on the basis of size, distance to nearest water, but it is also characterized by a 91 percent occurrence of Etowah association soils and proximity to swamps. The latter is true for the higher elevations surrounding the swamp areas. Fifty percent of the six sites for which chronological information exists are Archaic period sites, primarily Middle Archaic or late Archaic. Only two sites exhibit any evidence of Early or Middle Woodland occupation and one of these also shows evidence of Archaic occupation.

Cluster 5 consists of 14 sites which were also all originally defined as limited activity sites, except for site 49, the isolated mound and site M4140, a basecamp. Both of these sites were the furthest away from the center of the cluster. They appear to have been included here primarily due to their measurements on distance to next nearest water and next nearest stream. If withdrawn, the cluster's mean site size would further decrease from 2,071 square meters to 1,881 square meters. Distance to the Tennessee River for all other sites in this group is less than the overall mean of 4,718 meters. While distance to the nearest water source in general is higher, distance to the nearest stream is decreased. The latter is due to the frequency of sites in this cluster located on lakes. Cluster 5 represents the next most homogenous cluster. Fifty-six percent of sites for which chronological data exists are Archaic with 22 percent accounted for by Archaic and Woodland. The last 22 percent is characterized by Woodland occupation only. Etowah and Decatur-Cumberland soil associations occur at 64 percent of the sites while the remaining sites tend to be located on single occurrence soils. Eighty five percent of all these sites are also located either close to or along the edge of the remnant lake beds in the Boundary Canal Basin and Adjacent Uplands area (64%) or to swamps (21%).

The above k-means cluster analysis produced a more viable framework than the average linkage analysis, in which to view prehistoric sites. Those sites that were clustered as one or two individuals are the mound/villages and large village/basecamp, and are significantly different from all other sites. These three sites can be considered as Cluster 1. More isolated clusters were produced which are characterized by several notable differences. These were Clusters 2, 4 and 5. The most distinguishable features relate to size, distance to the Tennessee River and chronology. Additionally, Cluster 2 differs from the other clusters in that four of the six basecamps were grouped into this cluster. While Clusters 4 and 5 are both composed of limited activity sites, several differences exist. Cluster 4 indicates that more Archaic sites are located further from the Tennessee River and that as their distance increases, overall site size increases, and proximity to a stream becomes more important. The means for Cluster 5 reflect an opposite trend; that is, as distance to the Tennessee River decreases, site size also decreases, and distance to other water sources other than the Tennessee are somewhat increased.

The k-means cluster analysis produced clusters of sites that could be related not only to environmental variables, but to differences in chronology, site type, and to some extent, soil type. These differences, though reflected in a general sense, were great enough to produce clusters characterized by a certain amount of cohesiveness as well as lending support to the categorization of sites by type. Table 60 provides a summation of Clusters which have been assigned labels based on the predominant site type.

In our research design (Chapter 5), we raised five specific issues that we felt the data would be suitable to address. Although certain of these issues are partially treated in the cluster analysis, each requires a more thorough interpretive discussion.

Research Issues

The first issue concerned the distribution of Early Archaic sites in relation to Paleo-Indian and Middle Archaic settlement trends. Using the combined information from our investigations, and those of Alexander and the WPA projects, four sites have yielded evidence of Paleo-Indian activity, five of Early Archaic, and twelve of Middle Archaic. Figure 119 illustrates the occurrence of these components in the study corridor. In only one case did Paleo-Indian materials co-occur with Early Archaic, and, at this site (1Ma31/32), Middle Archaic artifacts were also recovered. In total, three of the four Paleo-Indian components were found at sites that also contained Middle Archaic remains, and the fourth Paleo-Indian site also yielded evidence of Late Archaic activity.

Our data tend to support the argument that the Early Archaic settlement pattern does not appear to reflect a shift between Paleo-Indian and later Archaic trends. There is certainly no indication that the site locations reflect dramatic changes in subsistence

TABLE 60. SUMMARY TABLE OF K-MEANS CLUSTER ANALYSIS.

Cluster	Component	Characteristics
1*	Large village sites, some with mounds	<ol style="list-style-type: none"> 1) Maximal site size 2) Extended occupation from Archaic through Mississippian 3) Minimal distance from Tennessee River 4) Maximal distance to nearest water 5) Sites dispersed across several soil associations
2	Basecamps	<ol style="list-style-type: none"> 1) Large site size 2) Woodland occupation predominant 3) Increased distance to Tennessee River 4) Moderate distance to nearest water
4	Large limited activity sites	<ol style="list-style-type: none"> 1) Large site size 2) Archaic occupation predominant 3) Maximal distance to Tennessee River 4) Minimal distance to nearest water sources 5) Majority sites on Etowah Association soils
5	Small limited activity sites	<ol style="list-style-type: none"> 1) Minimal site size 2) Archaic and Woodland occupation predominant 3) Decreased distance to Tennessee River 4) Moderate distance to nearest water source 5) Majority sites on Etowah, Decatur-Cumberland association soils

* Clusters 1 and 3 combined to form Cluster 1.

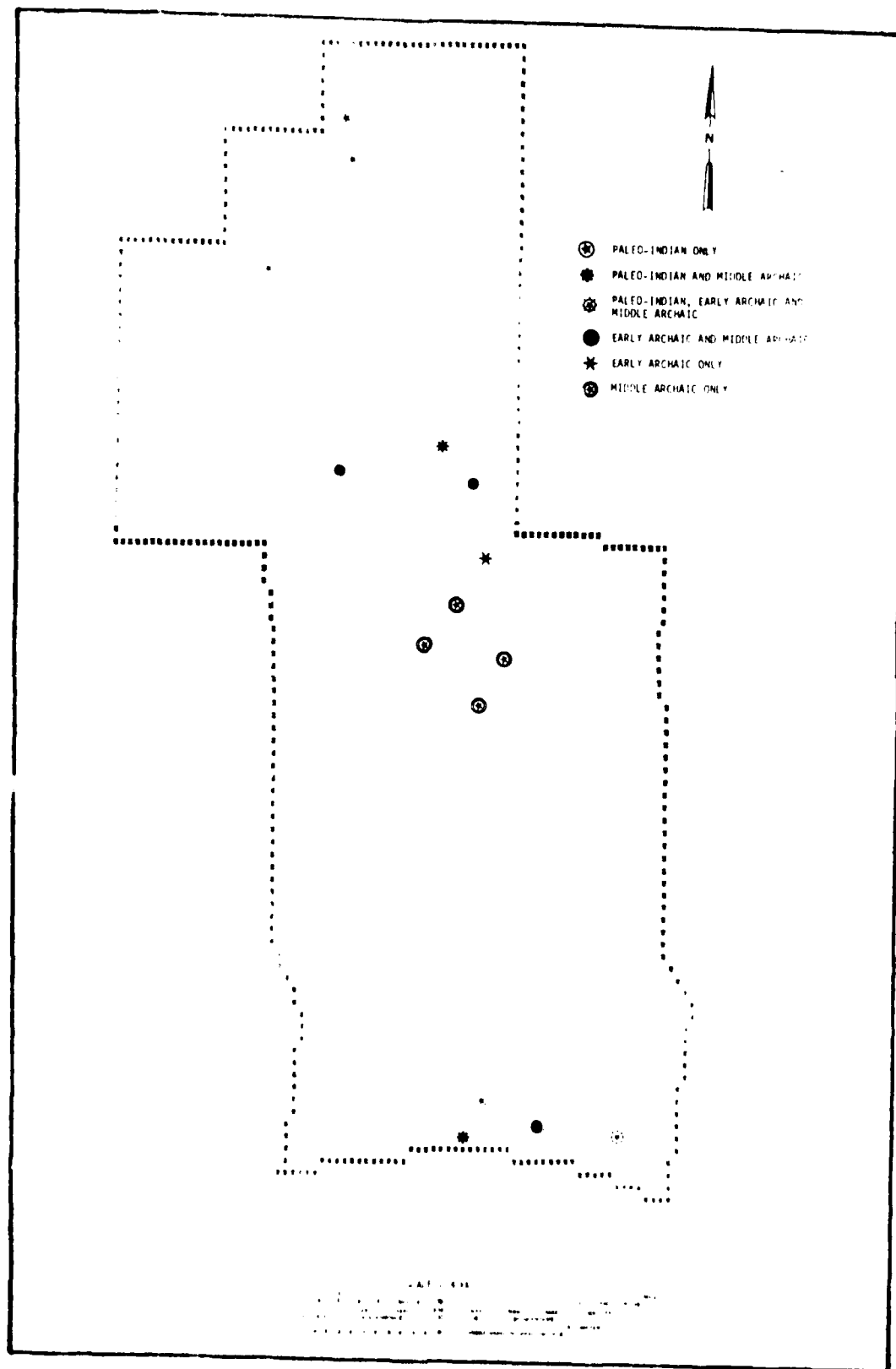


FIGURE 116. MAP SHOWING DISTRIBUTION OF PALEO-INDIAN, EARLY ARCHAIC AND MIDDLE ARCHAIC SITES IN RELATION TO EACH OTHER

strategies, and, in fact, the site information tends to reinforce a continuity in settlement from the Paleo-Indian period through the Early Archaic period, and to some degree in the Middle Archaic period. Perhaps the most striking aspect of settlement for these periods is the apparent increase in the number of Middle Archaic period sites over the earlier two periods. In seven out of 11 Middle Archaic period sites, no evidence of earlier occupation was found. It appears, therefore, that settlement decisions during this period may have been influenced by the needs of a larger population.

The second research issue focused on the possibility that an Eva-like phase preceded the Sanderson Cove phase of the Middle Archaic period. As mentioned in Chapter 2, Alexander (1979) reported an Eva point from one site, 1Ma156; however, it was a surface find that only indicated the presence of these points in the project area. Our investigations, unfortunately, have offered little data to address the possibility of an earlier Eva-like phase. At 1Ma156 we found no Eva or Eva-like points, but a rounded base Morrow Mountain point, the hallmark of the Sanderson Cove phase, was recovered. At 1Ma133, a single projectile point was identified as an Eva variant. Unfortunately, these diagnostics found during the course of our project, like the Eva that Alexander found, were all from the surface. While it is clear that Eva or Eva-like artifacts occur in the study corridor, the absence of stratigraphic separation of Eva and Morrow Mountain, precludes our being able to adequately assess the presence of an early Middle Archaic phase.

The third issue concerned the nature of Late Archaic settlement in the study corridor. As was shown in Table 60, the majority of Late Archaic sites were identified as limited activity stations; however, base camps were suggested for five of the 17 sites at which components of this period were located. There is a definite increase in site number during the Late Archaic period over the Middle Archaic period (Figure 120), and the data seem to indicate that there is greater diversity in types of sites represented. The data from both 1Ma141 and 1Ma143 which do address the question of possible subsistence modes actually do little to expand on what would be anticipated for the Middle or Late Archaic period subsistence strategies. As presented on Table 61, the data tend to confirm the presence of several differing indigenous species, but their occurrence does not lend any information concerning scheduling. The presence of five base camps and numerous activity stations, distributed throughout the study corridor, however, seems to support seasonal scheduling to exploit a full-range of available resources.

We had hoped to provide some data suitable for addressing the validity of Walthall and Jenkin's Gulf Formational Stage, but the Late Archaic sites investigated by this project offer little in the way of supportive or revisional information. We found no evidence of fiber-tempered ceramics. Where ceramics were present in a Late Archaic period context, all were identified as Hardin phase types. Probably the most outstanding of the Late Archaic sites was 1Ma133, at which

the deer and bear burial was uncovered (see chapter 5). Accompanying the burial were several gorgets and gorget fragments, a large quantity of flakes and debris, and the numerous wade points with one tang broken off. Surrounding this burial were found great frequencies of flakes and debris in other excavation units. The quantity of what appear to be deliberately damaged wade points and the frequency of flakes and debris in and around the burial pit further suggests that the points may have been produced at or close to the time of interment. The burial and its associated artifacts may point to some type of ceremonialism associated with hunting. Though the ethnobotanical analysis did not indicate the presence of seasonally-specific plants, the interment of the two animals may have corresponded to the beginning or end of a hunting season or episode. This scenario cannot, with current data, be substantiated.

With regard to the fourth issue, the validity of Green Mountain as a cultural divide, our data provide some clarification. The survey revealed evidence of both Middle and Late Woodland activity, but the best data to address this question were derived from the Late Woodland artifacts. Even though our study corridor lay primarily west of Green Mountain, the Late Woodland occupation at Site 1Ma133 is Flint River, traditionally placed to the east of Green Mountain. As is almost the case with cultural boundaries, there are irregularities in the evidence.

Finally, the last issue to be addressed was the absence of Early Mississippian in the project area. The results of our investigations provide no data to support either the suggestion that an hiatus occurred in the area between Late Woodland and Stobbs Island or that Early Mississippian manifestations in this area are culturally distinct from those to the west. In light of Bay's earlier results, it is somewhat surprising that we recovered no evidence of Mississippian activity at any of the sites. Although we retain the old designations for 1Ma132 and 1Ma33/50, not one Mississippian ceramic nor diagnostic projectile point was recovered during our work at these sites. As pointed out in the discussion of 1Ma31/32, our excavations and surface collection focused on an area not investigated by J. Sumnerfield Bay, so it appears obvious that his work fully excavated the Mississippian component and ours located a component dating to the Late Woodland period. At 1Ma33/50 Bay identified a Late Woodland village and the early stages of mound erection were contemporaneous with that occupation. Our data support this assignment. The absence of Mississippian remains at that site probably reflect the fact that activity during that period was primarily confined to the mound area. The important village may have been located at 1Ma31/32 immediately to the east.

Chronology and Settlement of Historic Sites

The history of occupation throughout the project area has been detailed in chapter 4. In the preceding sections of this chapter, the details of the relative stratigraphy performed for the historic sites

found in the archaeological survey, and sites previously recorded and subsequently tested during this project, have been presented. The following is a summary of the data presented in Chapters 4 and 5, and the initial portion of this chapter.

From the archaeological record, it is apparent that the historic occupation of the project area began about 1604. The settlements of Whitesburg, Martinsville, and initial landing were established by that date; however, recent research (Cole and Hoole n.d.) indicate that the majority of the population resided on rural, single-family farms unevenly distributed throughout the surrounding countryside. The densest occupation was along the Tennessee River, where the agricultural potential was highest. Settlement in the uplands, away from the river, tended to cluster along the secondary streams, or on the margins of the bottomland swamps. The obvious explanation for the pattern was the exploitability of the bottomland and floodplain soils in each location.

The settlement pattern, one of rural dispersement, continued virtually unaltered up to the time of the land purchases for the establishment of Redstone Arsenal. All historic sites recorded, with the exception of 1Ma215, apparently date to the period between about 1600 and the inception of the Arsenal. 1Ma215, from the technique used in its construction, dates to the post World War II period.

The historic sites or components recorded or tested during the project indicate that, as throughout the Southeast, the settlement pattern within the project area is indicative of an agriculturally based society. Single family units, of either tenant or owner status, are the prevalent site types, and subsequent land clearance within the Federal land effort has eradicated the majority of the associated structures. The few standing structures that remain indicate a differentiation in construction techniques between the possible tenant housing (e.g., 1Ma215) and the possible owner housing (e.g., 1Ma215). Tenant structures tend to be tightly clustered around the housing units, though not the barns (1Ma215) and other support buildings associated with the site. All Federal portions of the project area.

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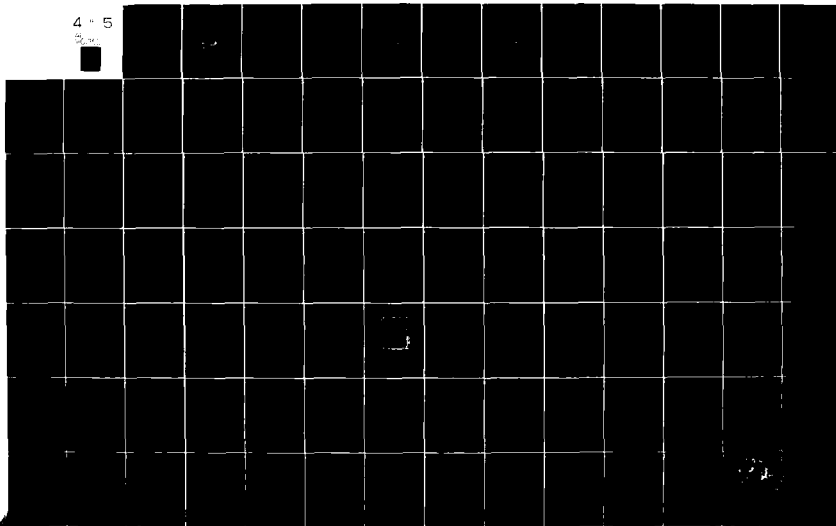
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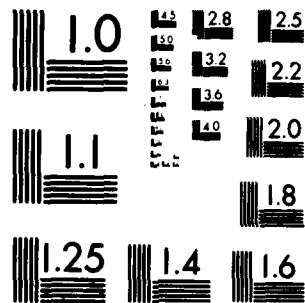
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10. IMPLEMENTATION OF THE PREDICTIVE MODEL
ON ALTERNATE TECHNIQUES FOR THE CONTAINMENT OR
ISOLATION OF DDTR CONTAMINATION

By

Prentice M. Thomas, Jr.

Six alternative techniques are under consideration for containment or isolation of DDTR contaminants in Huntsville Spring Branch (HSB). In the following paragraphs, we shall consider the potential for cultural resources being located in each of the proposed alternative impact areas, and will attempt to evaluate the alternatives in terms of their probable effect on archaeological sites.

1 - Dredging and Disposal

This technique would involve physical removal of sediments containing DDTR contamination, followed by disposal of contaminated spoils. As indicated on Figure 1, the dredging would affect a substantial area of HSB, Wheeler Lake, and Indian Creek. In addition to dredging, access roads will be constructed along the shore of all of the water bodies.

Although no known archaeological sites lie directly within the impact zone, nine sites are presently recorded within 100 or 200 meters (328 to 656 feet) of the access roads or dredge areas (Figure 1). These sites include 1Ma96, 107, 118, 119, 120, 121, 122, 127, and 134. Six of the nine sites are prehistoric, two are historic house sites, and one is of undetermined affiliation. None of the sites have been evaluated for eligibility to the National Register of Historical Places. Even though none of these sites lies directly in the impact zone, all are very close to the dredge areas. Extreme caution would have to be exercised in order to avoid damaging these resources.

In addition to the nine presently known sites, it is highly likely that other undiscovered prehistoric and historic sites are located within this impact zone. As pointed out in the Predictive Model, proximity to water is one of the most reliable indicators of prehistoric site location. The majority of limited activity and base camp sites are located at distances of 200 meters (656 feet) or less from perennial streams, lakes, or swamps. The Wheeler Basin is characterized by an extremely intensive prehistoric occupation, and any elevated knoll, ridge, or terrace marked by well-drained Etowah, Decatur/Cumberland, or other silty loam soils, and within a short distance of water, is highly likely to yield evidence of prehistoric occupation. Since this alternative for DDT mitigation will affect an

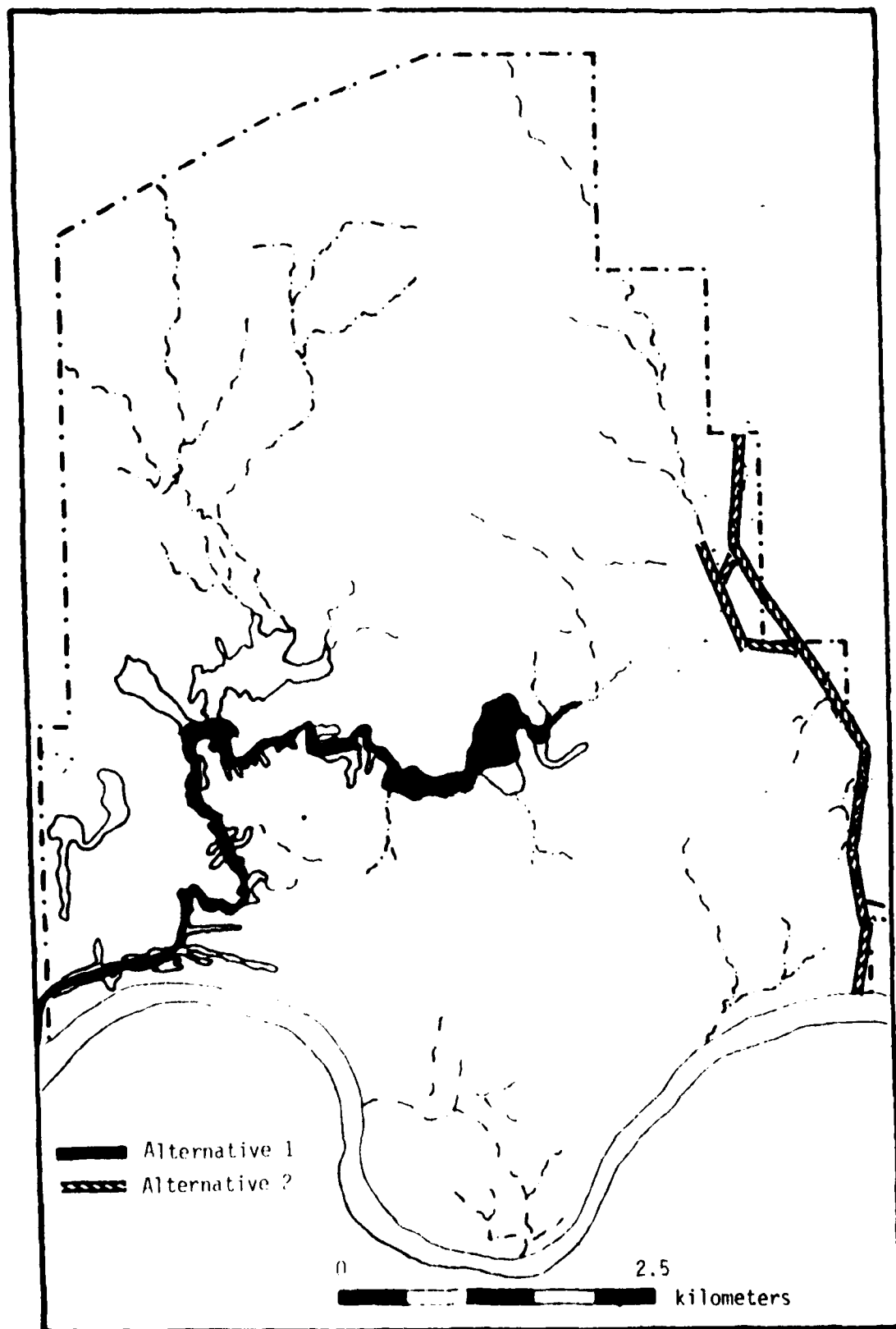


FIGURE 118. ALTERNATIVES 1 AND 2 FOR THE CONTAINMENT OR ISOLATION OF DDTR CONTAMINANT AT REDSTONE ARSENAL.

enormous linear distance of shoreline, it follows that the potential for impacting unreported prehistoric sites is substantial. This potential is made even more dramatic by the extensive zones of suitable soils lining the waterways. It is evident that dozens of yet undiscovered sites would be impacted if this alternative is selected.

The lower HSB, Wheeler Lake, and Indian Creek system is somewhat difficult to evaluate on the basis of our study. Although the reconnaissance survey included the upper reaches of HSB, none of the project corridor touched upon the portions of streams near their juncture with the Tennessee River. Therefore, we are not certain whether the Tennessee River settlement zone is similar throughout the Arsenal or whether, around Indian Creek, the Tennessee River settlement system extends further to the north. The issue is crucial in terms of evaluating the potential occurrence of mound and village sites.

Nevertheless, the potential along the shore for additional, undiscovered sites dating to the Paleo-Indian, Archaic, and Woodland periods is extremely high. In view of the large area affected, there is a 99 percent probability that unknown limited activity sites of one, two, or three periods will be impacted. Also, there is a 99 percent chance that new base camp sites of the Archaic and Woodland periods will be encountered.

In addition to the high probability for sites being located along the shore, it is quite likely that the dredging will disturb sites inundated by the waters of the Wheeler Reservoir. The archaeological survey of the Wheeler Basin conducted in the 1930s (Webb 1939) focused exclusively on sites located on the Tennessee River. No survey was undertaken along the tributary streams such as Indian Creek or HSB. After the dam was completed, the waters backing up in the Wheeler Reservoir flooded substantial portions of alluvial bottomland, and doubtless inundated unreported archaeological sites situated on low knolls. Sites in the Reservoir that were flooded in this manner may well remain intact, and efforts must be made to locate them prior to dredging.

In addition to prehistoric sites, the proposed dredging will quite possibly impact unreported historic sites. At present, only two historic house sites are known in the vicinity of the dredging area. These sites are 1Ma119 and 1Ma122. However, the map of Rural Delivery Routes of Madison County prepared in 1934 indicates not two, but at least five, historic houses located in close proximity to the impact area. If this map is accurate, several additional historic sites may be affected by this alternative.

2 - Out-of-Basin Diversion and Removal of Contaminated Sediments in HSB.

Alternative 2 includes construction of a diversion channel to divert the flow of HSB and McDonald Creek around the contaminated area. This channel will intersect HSB and McDonald Creek at some

point above the contaminated areas and will divert them into the Tennessee River.

Several alternative alignments have been considered for the out-of-basin diversion (Figures 1 and 2). Route 1 falls within our study corridor and involves diverting HSB into the Unnamed Boundary Canal.

Ten archaeological sites fall directly within the impact zone of proposed Route 1 (Figures 1 and 2). These include sites 1Ma33/50, 133, 140, 141, 157, 158, 159, 162, 209, and 218. An additional six sites lie in close proximity to the corridor, and any of them might be affected by construction. These sites include 1Ma152, 156, 210, 212, 217, and 229.

Two sets of alternate alignments have been suggested for Route 1. In the northern portion of the route, the diversion canal would intersect HSB at one of two locations. The easternmost alternative would impact site 1Ma209, while the western alternative would impact site 1Ma162. These are the only two sites known to occur along these alternate sections.

To the south, two alternate routes have been suggested for bypassing Gate 3 at the Arsenal. The easternmost alternative would pass very close to site 1Ma218, while the westernmost route would pass rather close to site 1Ma152.

Sites likely to be impacted by Route 1 which appear to be of National Register significance include 1Ma33/50, 133, 140, 141, 156, 162, 209, and 210.

Proposed Route 1 passes through both the Upland and the Tennessee River Settlement Zone. Consequently, this route has the maximum potential for impacting every type of site known in the region. Also, it is highly probable that additional, undiscovered sites lie within the corridor (Figure 1). This is especially true of areas adjacent to the Boundary Canal where zones of Etowah silt loam or silty clay loam, Decatur/Cumberland silty clay loam, Captina and Capshaw loams, Ooltewah silty loam, Linside silty clay loam, or Allen fine sandy loam occur near the water. In the northern portion of the corridor, additional limited activity sites and possibly base camp sites may occur north and west of site 1Ma159. It is, however, unlikely that additional mound or mound and village sites lie along this corridor within the Tennessee River Settlement Zone.

More known archaeological sites occur within this proposed corridor than along any of the other alternate alignments. However, more archaeological survey work has been completed in this area, and it is a reasonable assumption that the greater number of sites is a direct consequence of the intensity of the survey. Additional investigations along other alignments would doubtless even the numbers.

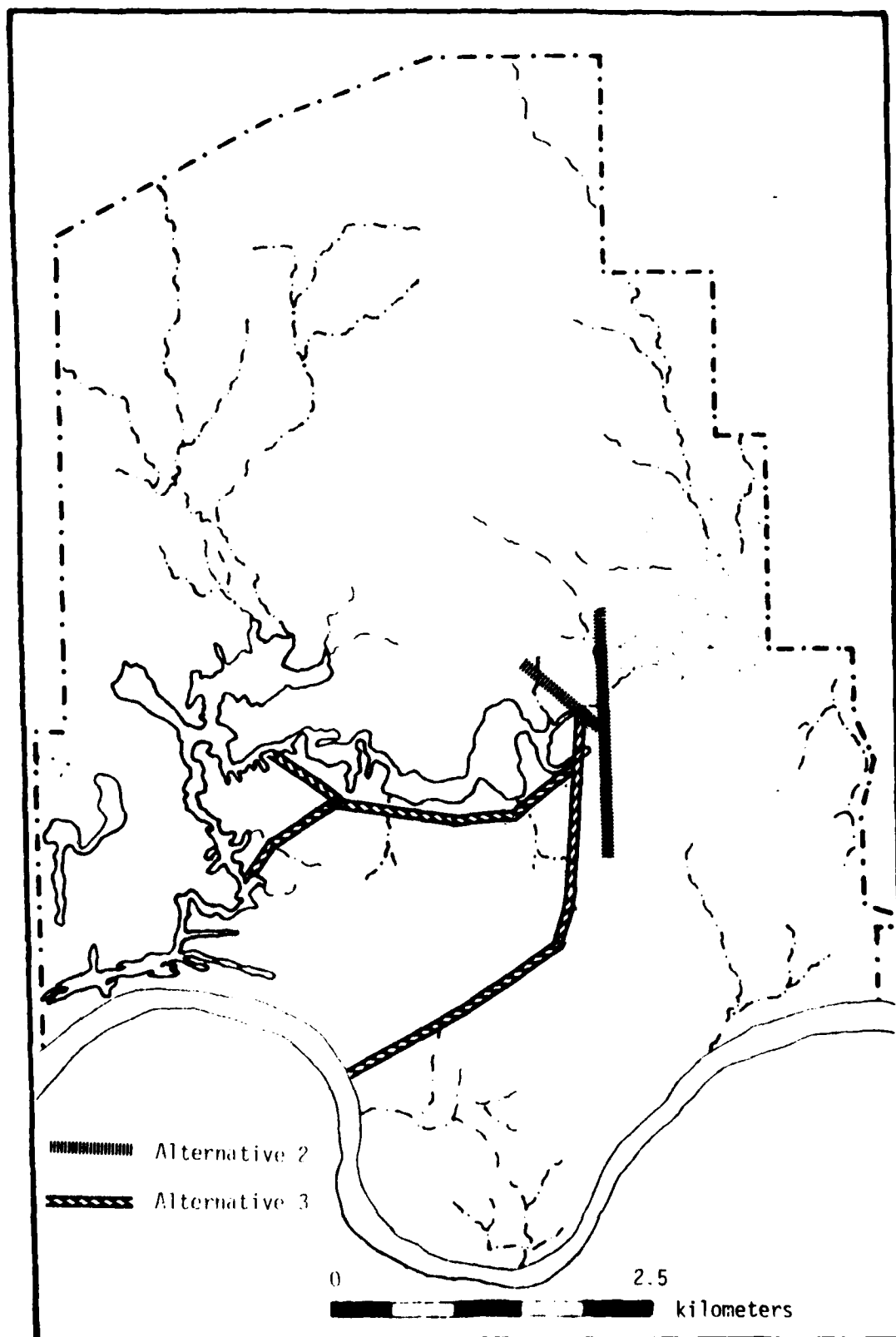


FIGURE 119. ALTERNATIVES 2 AND 3 FOR THE CONTAINMENT OR ISOLATION OF DDTR CONTAMINANT AT REDSTONE ARSENAL.

In conjunction with the out-of-basin diversion route 1, several areas are under consideration for the location of flood control levees which would prevent storm flows from utilizing the original, contaminated stream bed. This proposed area encompasses two known archaeological sites, 1Ma127 and 134. Since the construction of the diversion dike and the elevation of Patton Road will affect a sizeable area in the vicinity of HSB, it is quite possible that additional, undiscovered archaeological sites will be impacted. There is a rather high probability for both limited activity sites and Archaic or Woodland base camps to be located in the construction zone.

Two methods of removing contaminated sediments are under consideration---dry excavation and hydraulic dredging. Either procedure would impact archaeological sites located in proximity to existing swamps or streams. The activities and their probable impact on archaeological sites are similar to those discussed under Alternative 1 - Dredging and Disposal, except that in this portion of the Arsenal, there occur no areas of possible inundated sites such as at Wheeler Lake.

3 - Out-of-Basin Diversion of HSB

In addition to solution 2, out-of-basin diversion of HSB, several other alternative routes have been considered for the diversion of HSB (Figure 2). These alternatives would have involved diverting the flow of HSB from a point just northeast of Wheeler Lake. Canals would have been developed to carry the waters south and west to the Tennessee River, or west to one of several possible junctures with Indian Creek. All of these alternatives have been eliminated and will not be considered further, but examination of the site probability map clearly indicates that any of the routes would have been certain to impact a large number of archaeological sites.

4 - Within-Basin Diversion and Removal of Contaminated Sediments

The within-basin diversion would consist of a bypass channel around the area of maximum contamination. It would divert the flow of HSB from a point northeast of Wheeler Lake and channel it south and west of the contaminated zone. In order to prevent contaminated waters from flowing into the bypass channel during periods of flooding, a containment dike will be constructed along the north side of the channel.

Only one presently known archaeological site lies in the zone of direct impact (Figure 3). This site is 1Ma134, a small lithic scatter. Although site 1Ma134 is the only site located directly within the proposed construction zone, six sites are located in close proximity to the channel or containment dike. These sites include 1Ma107, 118, 119, 120, 121, and 127.

The within-basin diversion plan would impact a significantly smaller area than the out-of-basin Route 1 plan. Accordingly, the

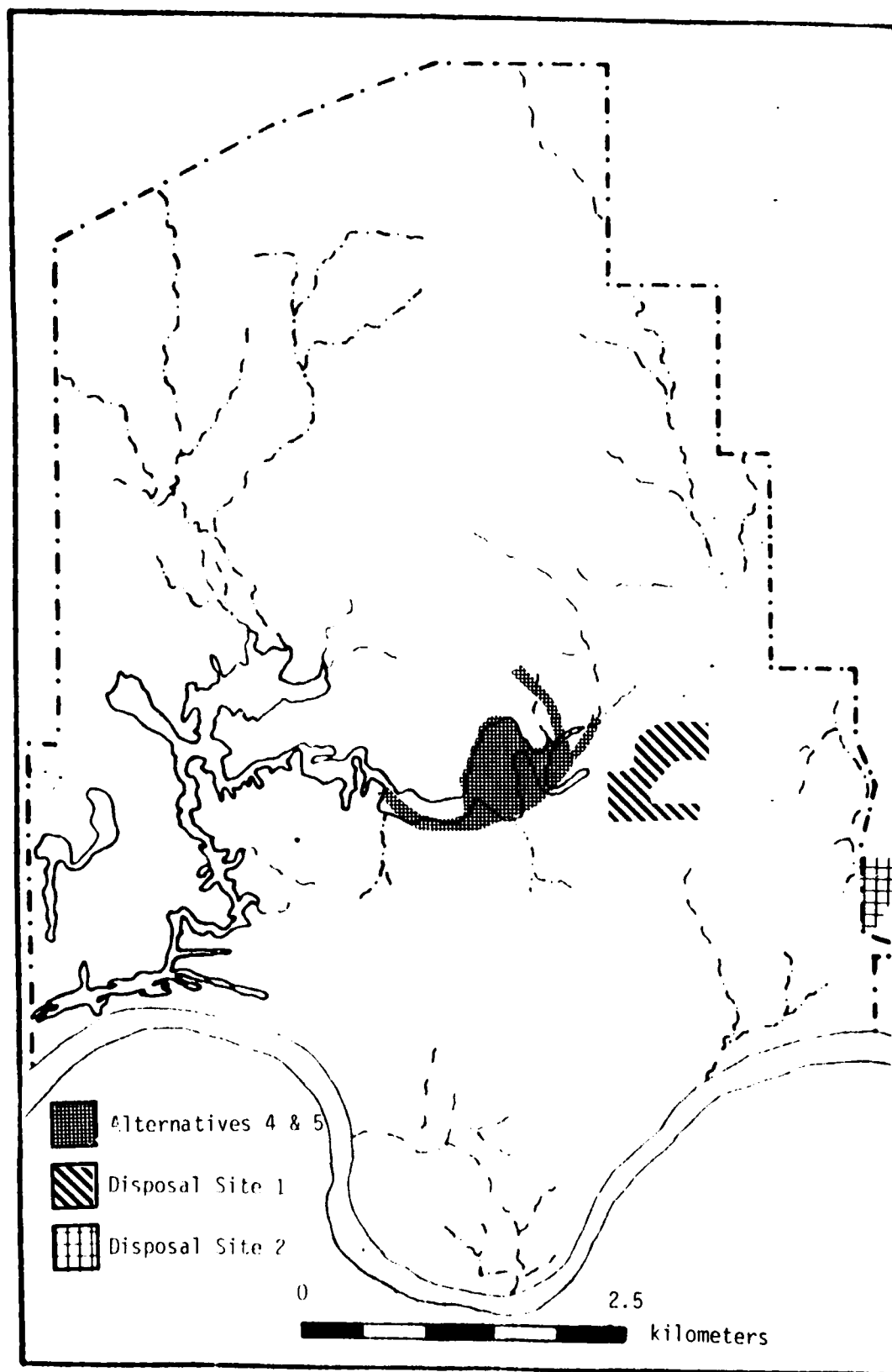


FIGURE 120. ALTERNATIVES 4 AND 5 AND DISPOSAL SITES 1 AND 2 FOR THE CONTAINMENT OR ISOLATION OF DDTR CONTAMINANT AT REDSTONE ARSENAL.

potential for damage to archaeological sites is reduced. Also, this plan would not impact sites in the Tennessee River Settlement Zone, thus reducing the probability of encountering large mound or mound and village sites of the Woodland and Mississippian periods.

Most of the sites presently known in this corridor consist of: 1) limited activity sites, and 2) historic house sites located on ridge crests or lower ridge slopes along the northwest shore of HSB. However, numerous zones of Etowah silt loam or silty clay loam, Captina and Capshaw silt loams, and Ooltewah silt loam occur near the south shore of HSB and Wheeler Lake. These locales are highly probable locations for prehistoric sites, particularly Archaic and Woodland limited activity sites, and possibly base camp sites. Other highly likely locations for prehistoric sites are elevated knolls of Etowah and Captina-Capshaw soils in the vicinity of an old oxbow on the eastern margin of the impact area.

Two methods are being considered for removal of the DDTR contaminated sediments, dry excavation and hydraulic dredging. The former method would require the excavation of swamps to receive water from the confined area. If these swamps are located in the vicinity of the containment dike, it is highly likely that archaeological sites will be affected. Hydraulic dredging will pose risks to cultural resources similar to those discussed under Alternative 1.

5 - Within-Basin Diversion and Containment of Contaminated HSB Sediments

This alternative would have an essentially identical impact on cultural resources as Alternative 4, within-basin diversion and removal of contaminated sediments (Figure 3).

Dredged Material Disposal Sites

All of the alternative solutions that involve dredging contaminated deposits require the use of a dredged material disposal site. Currently two locations are under consideration as disposal sites (Figure 3). The primary dredged material disposal site is located on the Arsenal northeast of the junction of Redstone Road and Patton Road (Disposal Site 1). Only one archaeological site has been reported from this area, 1Ma127. However, there is a strong possibility that additional sites are located at the disposal site. The area encompasses an expanse of elevated terrain on the margin of HSB and also bordering a swamp. Such a situation was a highly favored site location. Also, a rank 1 stream drains the uplands in this area and joins HSB northeast of the disposal site. Again, elevated terrain adjacent to a feeder stream was a common location for sites, both during the Archaic and Woodland periods.

The alternate dredged material disposal site is located just east of the Arsenal and south of Redstone Road (Disposal Site 2). Three

sites are known to exist within the area encompassed by the alternate disposal site. These sites include 1Ma216, 217, and 218, all pre-historic lithic scatters. None is eligible for listing on the National Register of Historic Places, and no additional work has been recommended for the sites. During our reconnaissance survey, the northern half of the alternate dredged material disposal site was examined and only the three sites noted above were found. The southern half of the disposal site has not been surveyed; however, and it is highly probable that additional unreported sites occur in the area. In particular, a large zone of Etowah, Decatur/Cumberland, and Linside soils located near the margin of a former lake will almost surely be found to contain archaeological sites.

6 - Natural Restoration

This alternative would have no impact on cultural resources.

In sum, the alternatives likely to cause the least damage to cultural resources, other than natural restoration, are Alternatives 4 and 5, within-basin diversion of HSB. These two solutions are essentially identical in terms of their impact on cultural resources, and they are preferable from an archaeological point of view because they will directly impact only one reported site and pose a possible threat to only six additional sites. Perhaps more important, fewer high and medium probability site locations will be affected by these alternatives, thus reducing the probable number of unreported sites that will be encountered.

Alternative 2, out-of-basin diversion of HSB, will affect the largest number of known sites. But, as mentioned previously, this is the most thoroughly surveyed of the alternatives, and a greater percentage of the total number of potentially affected sites have already been reported. Based on our predictive model, a substantial number of additional unreported sites are likely to be encountered along this corridor, but no new mound or large village sites are likely. The number of known sites, plus the number of unknown sites likely to be affected, is clearly greater with this alternative than is the case for the within-basin diversion solution. Also, the number of sites eligible or potentially eligible for the National Register is greater in the out-of-basin diversion solution.

Alternative 1, dredging and disposal is potentially the worst solution from the standpoint of protecting cultural resources. This solution will involve direct impact to an extremely large number of high probability locations along the shore of the streams. In addition to the potential for encountering a host of unreported sites along the shoreline, there is the problem of sites inundated by waters of the Wheeler Reservoir. We have no way to accurately predict how many sites located in the alluvial bottomlands of Indian Creek and HSB are now covered by the Reservoir's waters. However, we do know that sites occur in profusion on very slight elevations along all of the streams in our study corridor. The elevations are so slight that many

would have been submerged in the Reservoir; and if sites were situated on these knolls, they too would now be under water. Thus, the dredging and disposal solution would not only impact a large number of high probability locations, but it also would affect a large zone in which site potential cannot be predicted.

Recommendations

It is clear from the above discussion that all of the solutions for mitigating the DDT contamination at Redstone Arsenal will impact cultural resources. Further, the predictive model based on the reconnaissance level survey indicated that all proposed solutions will involve significant land modification in areas where it is highly likely that unreported sites are located. Consequently, we must recommend that once a solution has been selected and the construction plans have been finalized, a 100 percent intensive level cultural resources survey should be conducted in the impact area. Also, all sites to be affected, both those presently known and any that are discovered during the survey, should be evaluated for significance.

11. RECOMMENDATIONS

Based on the results of our investigations, the significance of each site was evaluated in terms of criteria for eligibility for listing in the National Register of Historic Places. The lengthy presentation of data in the discussion of the sites provides the basis for our evaluation of each, and need not be repeated here. In that section, the size of each site is documented, as is its cultural affiliation, condition, and all factors crucial in determining significance. In making our evaluations, we relied upon these and other criteria listed in the guidelines published in the Advisory Council's Procedures for the Protection of Historic and Cultural Properties (36CFR 800.10). Although the specific details vary for each site, the evaluations are of two general types: either a site is deemed significant and, therefore, eligible for listing in the Register, or it is not.

If a site has been subjected to testing and a background search, and is considered not to be eligible for the Register, then no additional archaeological work is warranted. On the other hand, if a site appears significant in terms of the guidelines noted above, then recommendations for further work or mitigation of adverse effects are in order. In Tables 61 through 68, a brief description of each site is presented, along with our recommendations for or against further work.

In general terms, the recommendations fall into five categories, three in which no additional action is suggested, and two in which mitigative measures are deemed appropriate. No additional work is recommended at: (1) recent historic sites; (2) light lithic scatters without integrity; or (3) sites which have been completely excavated; additional work is suggested at: (4) sites deemed eligible for the Register because of in situ cultural deposits; and (5) at sites with heavy artifact densities, where weather prevented completion of all of our testing procedures.

1. Historic sites that are fifty years of age or less usually are not eligible for inclusion in the National Register. There are seven such sites in the project corridor: 1Ma213, 1Ma214, 1Ma215, 1Ma219, 1Ma221, 1Ma222, and 1Ma228. These all consist of standing structures of recent date, or artifact scatters of modern debris. Even if some of these structures were actually constructed before 1929 (and none seems to pre-date 1900), they constitute a small element of a very widespread rural settlement pattern. Similar structures and sites are to be found over a large portion of northern Alabama, and it would be extremely difficult to argue that the sites are of significance in terms of being unique, or offering the possibility of advancing scientific knowledge.

2. Light scatters of very low artifact density are found in profusion in the Tennessee River Valley. Although such sites formed part

TABLE 61. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma31/32, 1Ma33/50, 1Ma49

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Surface collections, test excavations.	1Ma31/32	Maximum 220m N-S Minimum 45m N-S 690m E-W	Cultivated field	Heavy concentration of artifacts on surface: chipped & groundstone, ceramics, shell. Mound and village site excavated in 1939. <u>In situ</u> features remain in unexcavated areas.	Paleo-Indian; Early, and Late Archaic; Late Woodland; Mississippian (A).
Surface collections, test excavations.	1Ma33/50	Maximum 270m N-S Minimum 100m N-S 540m E-W	Cultivated field	Mound village site. Limited excavations in 1940s. Heavy artifact scatter on surface consisting of shell, chipped and groundstone, ceramics. <u>In situ</u> features below plow zone.	Early, Middle, and Late Archaic; Late Woodland; Mississippian (B).
Surface collections, test excavations.	1Ma49	35m N-S 35m E-W	Forest	Burial mound excavated in 1941. Few artifacts on surface.	Middle Woodland (D); Mississippian (B).
Surface collections, test excavations, backhoe cut.	1Ma133	160m N-S 95m E-W	Pine Forest	Artifacts eroding from spoil bank: chipped and groundstone and ceramics. Ceremonial bear and deer burial with Archaic artifacts found <u>in situ</u> .	Middle and Late Archaic; Late Woodland.

*(A) Indicates date based on Alexander's survey, not confirmed by our investigations.

(D) Indicates date based on S. Day's excavations, not confirmed by our investigations.

RECOMMENDATIONS FOR SITES 1Ma31/32, 1Ma33/50, 1Ma49, and 1Ma133.

Description	Chronology*	Recommendations
Heavy concentration of artifacts on surface: chipped & groundstone, ceramics, shell. Mound and village site excavated in 1939. <u>In situ</u> features remain in unexcavated areas.	Paleo-Indian; Early, Middle, and Late Archaic; Late Woodland; Mississippian (B).	National Register eligible because of <u>in situ</u> deposits. Important Mississippian site. Further work warranted in unexcavated areas.
Mound and village site. Limited excavations in 1940s. Heavy artifact scatter on surface consisting of shell, chipped & groundstone, ceramics. <u>In situ</u> features below plow zone.	Early, Middle, and Late Archaic; Late Woodland; Mississippian (B).	National Register eligible. Very rich Woodland mound and village site with <u>in situ</u> deposits. Further work warranted.
Mound excavated in 1941. Few artifacts on surface.	Middle Woodland (B); Mississippian (B).	National Register eligible since mound was reconstructed following excavation; but no further work is warranted since excavation is complete.
Artifacts eroding from spoil bank: chipped and groundstone and ceramics. Ceremonial bear and deer burial with Archaic artifacts found <u>in situ</u> .	Middle and Late Archaic; Late Woodland.	National Register eligible because of extraordinary <u>in situ</u> ceremonial burial. Further work warranted.

confirmed by our investigations.
 confirmed by our investigations.

TABLE 62. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma140, 1Ma141, 1Ma142, 1M

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Shovel pits, test excavations, gradall stripping, backhoe cut.	1Ma140	80m N-S 65m E-W	Pasture	Moderate lithic scatter eroding in farm road. Artifacts confined to old plow zone.	Middle and Late Arch Middle and Late Wood
Shovel pits, profile clearings, backhoe cut.	1Ma141	30m N-S 1km E-W	Forested bank of Tennessee River	<u>In situ</u> midden deposits eroded from river bank.	Paleo-Indian; Middle Archaic; Early and L Woodland.
Shovel pits, auger pits, test excavations, backhoe cut.	1Ma142	100m N-S 120m E-W	Pasture in Hazardous Demolition Zone	Heavy lithic scatter in disturbed areas. High frequency of lithics in sub-surface tests.	Late Archaic.
Surface collections, test excavations, backhoe cut.	1Ma152	55m N-S 55m E-W	Cultivated field	Historic component, light prehistoric lithic scatter.	Middle and Late Arch Historic.
Surface collection, test excavations, backhoe cut.	1Ma153	30m N-S 40m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.

RECOMMENDATIONS FOR SITES 1Ma140, 1Ma141, 1Ma142, 1Ma52, AND 1Ma153.

Description	Chronology*	Recommendations
Moderate lithic scatter eroding in farm road. Artifacts confined to old plow zone.	Middle and Late Archaic; Middle and Late Woodland.	Further work warranted only because this site is contiguous with site 1Ma33/50. It should not have been differentiated from 1Ma33/50.
<u>In situ</u> midden deposits eroded from river bank.	Paleo-Indian; Middle Archaic; Early and Late Woodland.	National Register eligible because of <u>in situ</u> midden. Further work warranted.
Heavy lithic scatter in disturbed areas. High frequency of lithics in sub-surface tests.	Late Archaic.	National Register eligible because of high frequencies of lithics. Further work warranted.
Historic component, light prehistoric lithic scatter.	Middle and Late Archaic (A); Historic.	No further work suggested unless site is to be impacted. If so, controlled surface collection following plowing recommended.
Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.	No further work.

TABLE 63. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma154, 1Ma155, 1Ma156, 1Ma157, 1Ma158

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology
Surface collections, auger tests, test excavations, backhoe cut.	1Ma154	40m N-S 45m E-W	Cultivated field	Lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.
Surface collections, test excavations.	1Ma155	40m N-S 30m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Late Archaic (A).
Surface collections, test excavations, backhoe cut.	1Ma156	30m N-S 50m E-W	Cultivated field	Lithic scatter. <u>In situ</u> material present <u>below</u> plow zone-hearth.	Middle and Late Archaic (A); Early Woodland (A); Woodland.
Surface collections, test excavations, gradall stripping, backhoe cut	1Ma157	No surface artifacts.	50% cultivated field, 50% pasture	One flake.	Late Archaic (A).
Surface collections, test excavations, gradall stripping, backhoe cut.	1Ma158	90m N-S 45m E-W	Cultivated field.	Lithic scatter. <u>In situ</u> material present-postmold.	Middle and Late Archaic (A); Woodland.

UR SITES 1Ma154, 1Ma155, 1Ma156, 1Ma157, AND 1Ma158.

tion	Chronology*	Recommendations
. Artifacts ow zone.	Prehistoric. No diag- nostics.	No further work.
atter. Arti- to plow zone.	Late Archaic (A).	No further work.
. In situ nt below plow	Middle and Late Archaic; Early Woodland (A); Middle Woodland.	National Register eligi- ble because of <u>in situ</u> feature. Further work recommended
	Late Archaic (A).	No further work.
. In situ nt-postmold.	Middle and Late Archaic.	No further work. Post- mold appears modern.

TABLE 64. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma159, 1Ma162, 1Ma180, 1Ma181

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Surface collection, test excavations, gradall stripping, backhoe cut.	1Ma159	10m N-S 15m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.
Surface collection, test excavations, backhoe cut.	1Ma162	85m N-S 45m E-W	Cultivated field	Recent historic site. <u>In situ</u> refuse pit. Light prehistoric lithic scatter.	Prehistoric. No diagnostics. Historic.
Surface collection, auger tests, test excavations, backhoe cut.	1Ma180	150m N-S 100m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Paleo-Indian; Late Archaic
Surface collections, test excavations, backhoe cut.	1Ma181	100m N-S 85m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.
Surface collection, auger test, test excavations, backhoe cut.	1Ma182	125m N-S 90m E-W	Cultivated field	Heavy lithic scatter.	Paleo-Indian; Archaic Late Woodland.

RECOMMENDATIONS FOR SITES 1Ma159, 1Ma162, 1Ma180, 1Ma181, AND 1Ma182.

Location	Description	Chronology*	Recommendations
ted	Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.	No further work.
ted	Recent historic site. <u>In situ</u> refuse pit. Light prehistoric lithic scatter.	Prehistoric. No diagnostics. historic.	National Register eligible because of intact historic midden. Occupation late nineteenth century.
ted	Light lithic scatter. Artifacts confined to plow zone.	Paleo-Indian; Late Archaic.	No further work.
ted	Light lithic scatter. Artifacts confined to plow zone.	Prehistoric. No diagnostics.	No further work.
ted	Heavy lithic scatter.	Paleo-Indian; Archaic (A); Late Woodland.	Recommend controlled surface collection and surface stripping during period of dry weather.

TABLE 65. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma183, 1Ma190, 1Ma209, 1Ma210

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Surface collection, auger tests, test excavations.	1Ma183	155m N-S 60m E-W	Cultivated field	Moderate lithic scatter. Artifacts confined to plow zone.	Middle to Late Archaic Woodland.
Surface collection, test excavations, gradall stripping.	1Ma190	65m N-S 15m E-W	Cultivated field	Light lithic scatter. One pottery sherd. Artifacts confined to plow zone.	Late Woodland.
Surface collections, auger tests, test excavations.	1Ma209	90m N-S 115m E-W	Cultivated field	Moderate to heavy lithic scatter. Historic component.	Middle and Late Archaic; Middle and Late Woodland; Historic.
Surface collections, test excavations, gradall stripping.	1Ma210	525m N-S 255m E-W	Cultivated field	Heavy artifactual scatter: chipped and ground stone, ceramics. <u>In situ</u> deposits, storage pits, postmolds. Historic component at extreme south end.	Middle and Late Archaic; Middle Woodland, Historic.
Survey and surface collection.	1Ma211	15m N-S 60m E-W	Cultivated field	Light lithic scatter (two lithics). Artifacts confined to surface.	Middle Archaic.

RECOMMENDATIONS FOR SITES 1Ma183, 1Ma190, 1Ma209, 1Ma210, AND 1Ma211.

Description	Chronology*	Recommendations
Moderate lithic scatter. Artifacts confined to plow zone.	Middle to Late Archaic (A); Woodland.	Recommend controlled surface collection and surface stripping during period of dry weather.
Light lithic scatter. One pottery sherd. Artifacts confined to plow zone.	Late Woodland.	No further work.
Moderate to heavy lithic scatter. Historic component.	Middle and Late Archaic; Middle and Late Woodland; Historic.	Further work warranted: controlled surface collection and surface stripping during period of dry weather.
Heavy artifactual scatter: chipped and ground stone, ceramics. <u>In situ</u> deposits, storage pits, postmolds. Historic component at extreme south end.	Middle and Late Archaic; Middle Woodland, Historic.	National Register eligible because of <u>in situ</u> features and house patterns. Further work warranted.
Light lithic scatter (two lithics). Artifacts confined to surface.	Middle Archaic.	No further work.

2

TABLE 66. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma212, 1Ma213, 1Ma214, 1Ma215, 1Ma216, 1Ma217, 1Ma218

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Surface collections, auger tests, test excavations.	1Ma212	125m N-S 125m E-W	Cultivated field	Moderate lithic scatter. Artifacts confined to plow zone.	Late Archaic.
Survey and surface collection.	1Ma213	45m N-S 35m E-W	Cultivated field	Standing historic structure.	Recent historic.
Survey and surface collection.	1Ma214	60m N-S 30m E-W	Cultivated field	Light lithic scatter (11 flakes, 1 tool). Historic artifact scatter.	Prehistoric. No diagnostics. Recent historic.
Survey and surface collection.	1Ma215	25m N-S 45m E-W	Secondary growth	Standing historic structure.	Recent historic.
Surface collection, test excavations.	1Ma216	75m N-S 75m E-W	Cultivated field	Light lithic scatter. Artifacts confined to plow zone.	Late Archaic.
Survey and surface collection.	1Ma217	55m N-S 45m E-W	Cultivated field	Light lithic scatter (23 lithics).	Prehistoric. No diagnostics.
Survey and surface collection.	1Ma218	80m N-S 30m E-W	Cultivated field	Light lithic scatter (27 lithics).	Late Archaic.

SITES 1Ma212, 1Ma213, 1Ma214, 1Ma215, 1Ma216, 1Ma217, AND 1Ma218.

Description	Chronology*	Recommendations
Lithic scatter. is confined to plow	Late Archaic.	No further work.
g historic structure.	Recent historic.	No further work.
Lithic scatter (11 i tool). Historic t scatter.	Prehistoric. No diagnos- tics. Recent historic.	No further work.
g historic structure.	Recent historic.	No further work.
Lithic scatter. Arti- onfined to plow zone.	Late Archaic.	No further work.
Lithic scatter (23).).	Prehistoric. No diagnos- tics.	No further work.
Lithic scatter (27).).	Late Archaic.	No further work.

2

TABLE 67. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma219, 1Ma220, 1Ma221, 1Ma222, 1Ma223, 1Ma224, 1Ma225

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Survey and surface collection.	1Ma219	35m N-S 35m E-W	Cultivated field	Historic artifact scatter, cattle pen.	Recent Historic.
Surface collection, test excavations.	1Ma220	50m N-S 45m E-W	Cultivated field	Light lithic scatter (34 lithics).	Late Archaic.
Survey and surface collection, backhoe cut.	1Ma221	Structure 4m sq.	Cultivated field	Recent historic garage.	Recent historic.
Survey and surface collection.	1Ma222	25m N-S 35m E-W	Cultivated field	Historic artifact scatter.	Recent historic.
Survey and surface collection.	1Ma223	60m N-S 70m E-W	Cultivated field	Moderate lithic scatter.	Paleo-Indian; Middle and Late Archaic; Late Wood
Survey and surface collection.	1Ma224	25m N-S 20m E-W	Cultivated field	Light lithic scatter (14 lithics).	Prehistoric. No diagnostics.
Survey and surface collection.	1Ma225	70m N-S 60m E-W	Cultivated field	Light lithic scatter (24 lithics).	Early and Middle Archaic

TABLE 67. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma219, 1Ma220, 1Ma221, 1Ma222, 1Ma223, 1Ma224, 1Ma225

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Survey and surface collection.	1Ma219	35m N-S 35m E-W	Cultivated field	Historic artifact scatter, cattle pen.	Recent Historic.
Surface collection, test excavations.	1Ma220	50m N-S 45m E-W	Cultivated field	Light lithic scatter (34 lithics).	Late Archaic.
Survey and surface collection, backhoe cut.	1Ma221	Structure 4m sq.	Cultivated field	Recent historic garage.	Recent Historic.
Survey and surface collection.	1Ma222	25m N-S 35m E-W	Cultivated field	Historic artifact scatter.	Recent Historic.
Survey and surface collection.	1Ma223	60m N-S 70m E-W	Cultivated field	Moderate lithic scatter.	Paleo-Indian; Middle and Late Archaic; Late Wood
Survey and surface collection.	1Ma224	25m N-S 20m E-W	Cultivated field	Light lithic scatter (14 lithics).	Prehistoric. No diagnostics.
Survey and surface collection.	1Ma225	70m N-S 60m E-W	Cultivated field	Light lithic scatter (24 lithics).	Early and Middle Archaic

FOR SITES 1Ma219, 1Ma220, 1Ma221, 1Ma222, 1Ma223, 1Ma224, AND 1Ma225.

Description	Chronology*	Recommendations
toric artifact scatter, tile pen.	Recent Historic.	No further work.
ht lithic scatter (34 pieces).	Late Archaic.	No further work.
ent historic garage.	Recent historic.	No further work.
toric artifact scatter.	Recent historic.	No further work.
erate lithic scatter.	Paleo-Indian; Middle and Late Archaic; Late Woodland.	Recommend controlled surface collection and surface stripping during period of dry weather.
ht lithic scatter (14 pieces).	Prehistoric. No diagnostics.	No further work.
ht lithic scatter (24 pieces).	Early and Middle Archaic.	No further work.

2

TABLE 68. SITE DESCRIPTIONS AND RECOMMENDATIONS FOR SITES 1Ma226, 1Ma227, 1Ma228, A

Level of Investigations	Site Number	Site Size	Present Condition	Description	Chronology*
Survey and surface collection.	1Ma226	100m N-S 65m E-W	Cultivated field	Moderate lithic scatter.	Early Archaic; Early woodland.
Survey and surface collection.	1Ma227	95m N-S 45m E-W	Cultivated field	Light lithic scatter (34 lithics).	Early woodland.
Survey and surface collection.	1Ma228	Individual Structure Dimensions	Uncultivated house site	Standing historic structure.	Recent Historic.
Survey and surface collection.	1Ma229	50m N-S 105m E-W	Cultivated field	Light lithic scatter (2 lithics).	Prehistoric. No diagnostics.

RECOMMENDATIONS FOR SITES 1Ma226, 1Ma227, 1Ma228, AND 1Ma229.

Description	Chronology*	Recommendations
Moderate lithic scatter.	Early Archaic; Early woodland.	Recommend controlled surface collection and stripping during period of dry weather.
Light lithic scatter (34 lithics).	Early woodland.	No further work.
Standing historic structure.	Recent Historic.	No further work.
Light lithic scatter (2 lithics).	Prehistoric. No diagnostics.	No further work.

of a more complex settlement system, and deserve thorough study, our present archaeological techniques for dealing with low-density, shallow sites are poorly developed. Such sites are most commonly found in plowed fields, where discovery is enhanced by the disturbance, but while aiding discovery, the cultivation also destroys site integrity. Deep deposits, such as pits or postmolds, may survive below the plowzone at the sites, and our testing procedures were designed to locate such undisturbed deposits. But, at sites where testing failed to reveal evidence of subsurface features, the only remaining suitable and cost-effective data recovery technique is surface collection. Controlled surface collections were not a part of our work plan, but, at small sites, the systematic collection intervals along the radial transects provide an adequate sample of site contents. In such cases, we do not feel that additional investigations would be productive, given present archaeological techniques.

There are nineteen sites of the type described above, for which no additional work is recommended. These are 1Ma154, 1Ma155, 1Ma157, 1Ma158, 1Ma159, 1Ma180, 1Ma181, 1Ma190, 1Ma211, 1Ma212, 1Ma214, (prehistoric component), 1Ma216, 1Ma217, 1Ma218, 1Ma220, 1Ma224, 1Ma225, 1Ma227, and 1Ma229.

3. One site, 1Ma49, was excavated in its entirety by H. Summerfield Day. Consequently, no additional archaeological work is warranted at the site. However, following excavation, Day reconstructed the mound, a Copena burial mound, and it remains today in near-original condition. The authors are unsure of precedents concerning excavated sites, at which earthen mounds have been reconstructed. Although the mound offers no further opportunity to advance the study of Copena culture, its integrity as a mound warrants its preservation. Therefore, we suggest that the site is eligible for listing in the Register, and should be protected.

4. Nine sites are considered eligible for listing in the National Register of Historic Places, and deserve protection. Seven of these, 1Ma1132, 1Ma3350, 1Ma133, 1Ma140, 1Ma141, 1Ma156, and 1Ma210, are prehistoric sites, at which intact deposits were found during testing. Each offers an excellent opportunity to advance the knowledge of prehistoric cultural development in the Tennessee River Valley. Also, each is sufficiently unique, within the project corridor, that it would not be possible to group them, and recommend a sample for listing in the Register. All seven require further work, in the event that they are threatened by future development. In addition to the seven prehistoric sites, one historic site, 1Ma162, produced an in situ trash pit, containing materials dating to the late nineteenth century. We suggest that such a deposit of refuse offers an excellent opportunity to study a turn-of-the-century life pattern, and, therefore, is also eligible for listing in the Register.

Finally, one site, 1Ma142, produced a very rich sample of Late Archaic artifacts. Although this site differs from the other significant sites, in that no intact features or midden were located, the

high artifact density and the single-component occupation are sufficient to consider the site significant. The site could provide a wealth of data on Late Archaic artifact typology and functional variation of tool categories. Also, it is possible that intact features occur in areas not examined by our subsurface tests.

5. At six sites, our investigations failed to show evidence of intact deposits. As discussed above, we recommended no further work at nineteen sites, where artifact densities were extremely low, where the radial transect collections covered a significant portion of the site area, and where the gradall or auger tests produced no sign of features or midden.

However, for the six sites in this group, one of several factors leads us to recommend additional work. At several of the larger sites, the radial transect collections served to define site boundaries, but resulted in a controlled collection from only a very small percentage of the site area. At such sites, particularly those with an artifact density sufficient to suggest an occupation of greater duration than a single flaking incident, we feel that a controlled surface collection is warranted. Such collections would produce a representative sample of artifacts for dating purposes, and could also provide information allowing the delineation of discreet activity loci and/or the horizontal separation of temporal components. Perhaps, more importantly, the extremely wet conditions prohibited stripping of the plowzone at several sites in this category. At such sites, our one-meter by one-meter test pits and limited augering simply did not expose an adequate area to confidently rule out the possibility that subsurface features are present. In these cases, we must suggest that a portion of the plowzone be stripped at the sites, in order to confirm the presence or absence of intact deposits.

Controlled surface collections, followed by stripping of the plowzone, are recommended for sites 1Ma152, 1Ma182, 1Ma183, 1Ma209, 1Ma223, and 1Ma226. We have refrained from specifically suggesting that these sites are eligible for listing in the National Register. However, additional work at each promises to yield data of importance in refining the cultural chronology of the area, in delineating cultural units, and in reconstructing the complex of settlement systems. We are not in a position to judge whether additional work would be required following controlled surface collection and stripping during dry weather. But we do feel that this additional step is necessary.

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n.d.b Excavation Record Sites Ma⁰³¹, Ma⁰³² (Ma^{V33} and Ma⁰⁵⁰). On file, Office of Archaeological Research, Moundville, Alabama.

This reference is Day's field excavation notes which present in detail the procedures and results of investigations at these sites.

n.d.c Excavator's Report Site Ma⁰⁵⁰ (Ma^{V33}). On file, Office of Archaeological Research, Moundville, Alabama.

This report is much briefer and less detailed than Day n.d.a, and reflects the limited work conducted at both the mound and the village area.

n.d.d Final Field Report of Excavations Site Ma⁰⁴⁹. On file, Office of Archaeological Research, Moundville, Alabama.

This report is the most detailed of the three summary statements prepared by Day. Included are dimensions and comparisons of the various burial features, a summary of the condition of the burials, and a description of the various artifact types recovered.

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As with Day (n.d.b) these represent field notes and provide a day-by-day discussion of work at the site, including explanations for certain approaches to be utilized.

n.d.f Feature Charts of Dimensions Characteristics and Artifacts, Ma⁰⁴⁹. On file, Office of Archaeological Research, Moundville,

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This study, edited by W. Stanley and Addie S. Hoole, was originally compiled by Judge Thomas Jones Taylor. It covers, in anecdotal form, the history of Madison County, with specific mention of the Huntsville area, from 1732 to 1840. The work is valuable in that it recounts the various roles played by the early settlers in the area, however, its primary worth is as a secondary source, for there is no apparent effort made to corroborate any of the data presented.

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The first in a series of monographs detailing the history of the Redstone Arsenal, this report sketches the development of the complex from its inception in 1941 through the war years and into its period of deactivization in the late 1940s.

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 1961 Eva, an Archaic Site. University of Tennessee Press, Knoxville.
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Report of Progress for 1879 and 1880, edited by Eugene A. Smith,
pp. 65-154. Alfred and Beers, Montgomery.

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Oakley, Carey B. and Eugene M. Futato

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Walthall's dissertation brought together virtually all of the published and unpublished materials on Copena Complex then in existence. Although much of his original contributions have been published by Walthall elsewhere, this volume remains a basic data source.

1973b A restudy of the Wright Village (Lu465), a Middle Woodland habitation site in Lauderdale County, Alabama. Tennessee Archaeologist 24:69-108.

This article briefly reports the author's re-examination of the data gathered at an important Copena phase site which was excavated in northern Alabama during the 1930s. His re-examination reveals that the Copena phase in northern Alabama was apparently closely related to or influenced by developments occurring in the central Midwest with the rise of the Hopewell tradition there.

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This final site report details the mapping and excavation of a key shell midden site on the Tennessee River in the Wheeler Reservoir area. This site was occupied during the Middle and Late Archaic periods and contains an almost pure Colbert phase component. As a consequence, the site provides us with much of our knowledge of the later Archaic culture in northwestern Alabama.

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APPENDIX I

MAPS FROM
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EXCAVATIONS

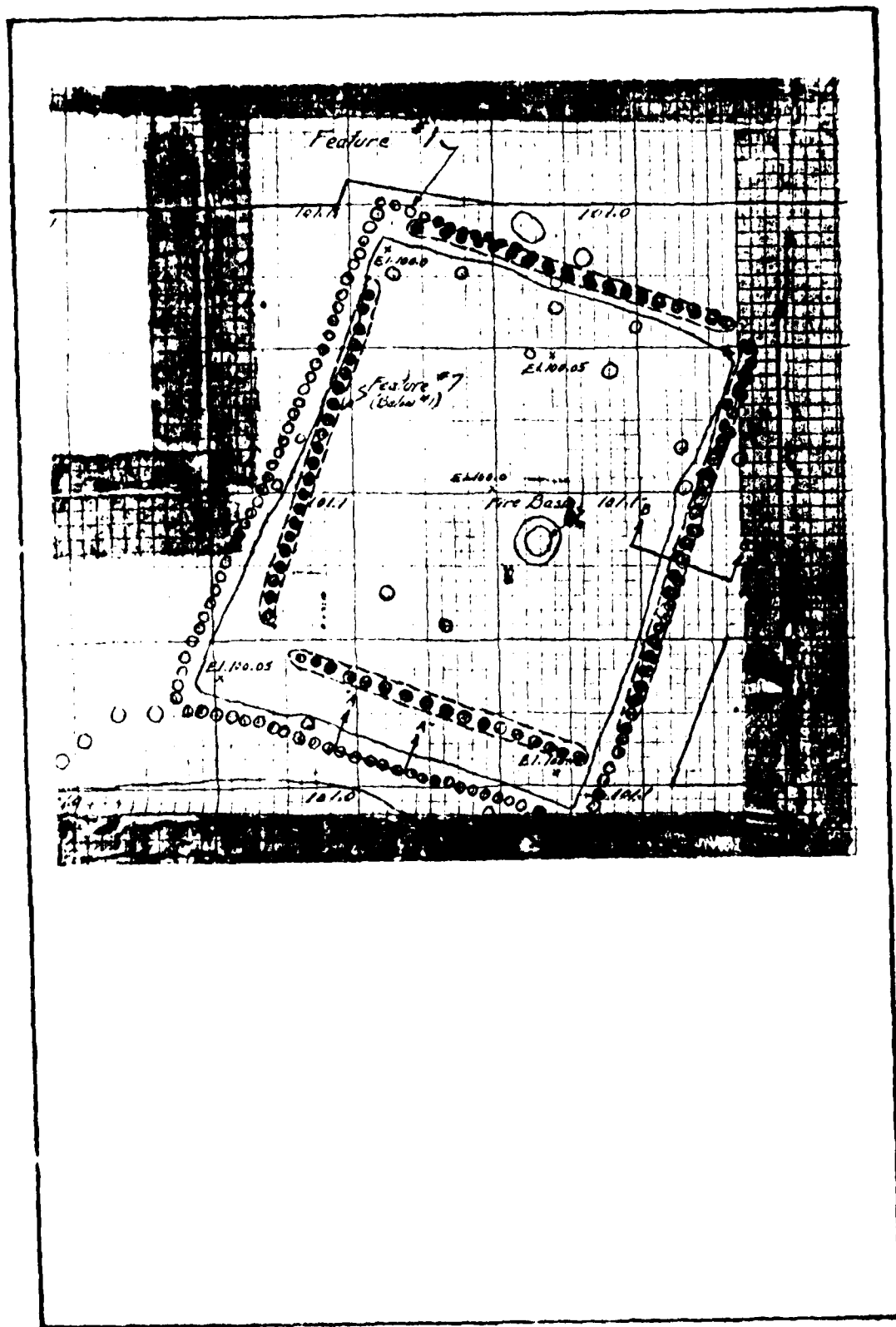


FIGURE 122. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURE 1 AND 7 AT SITE 1MaV31.

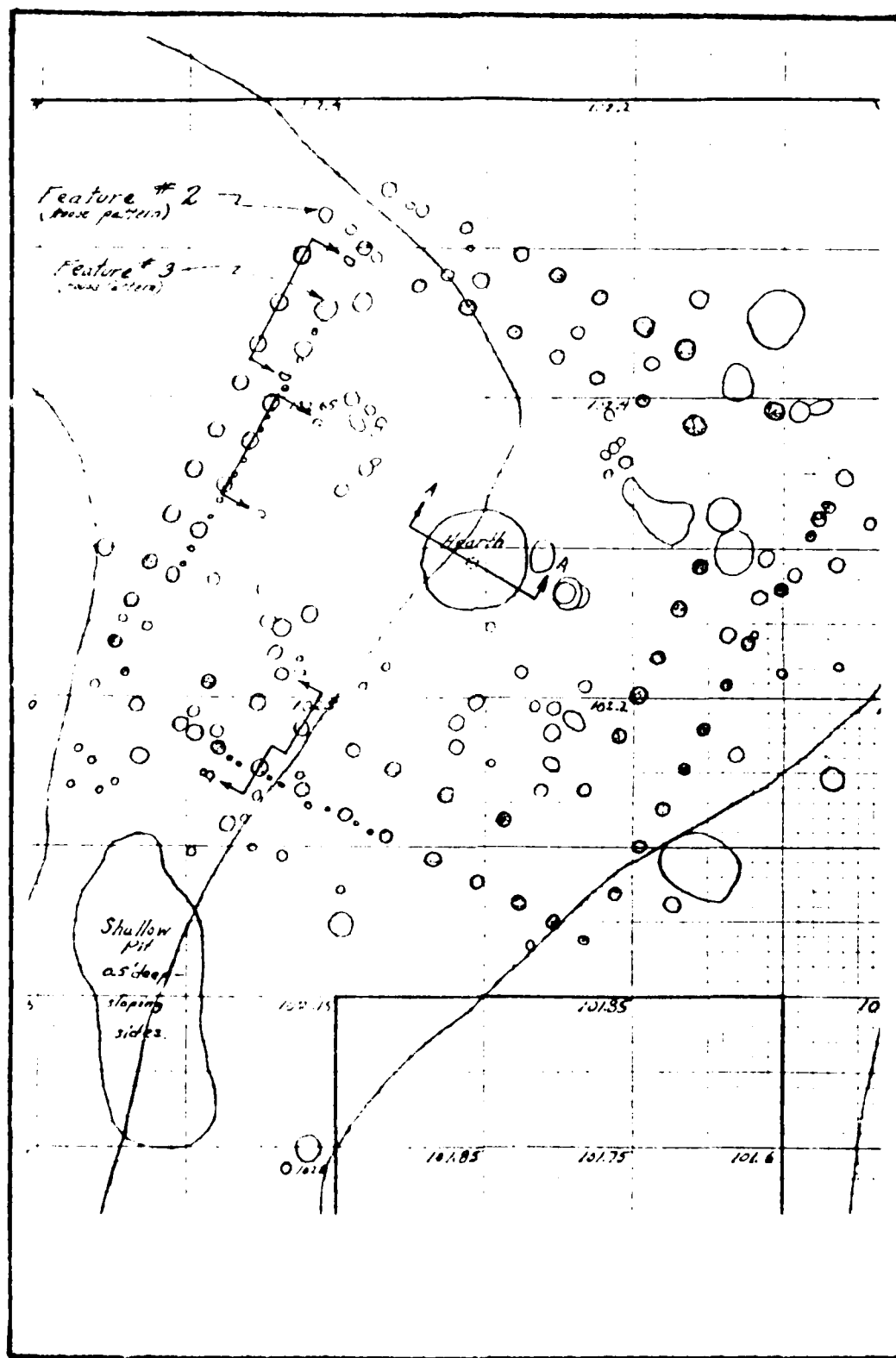
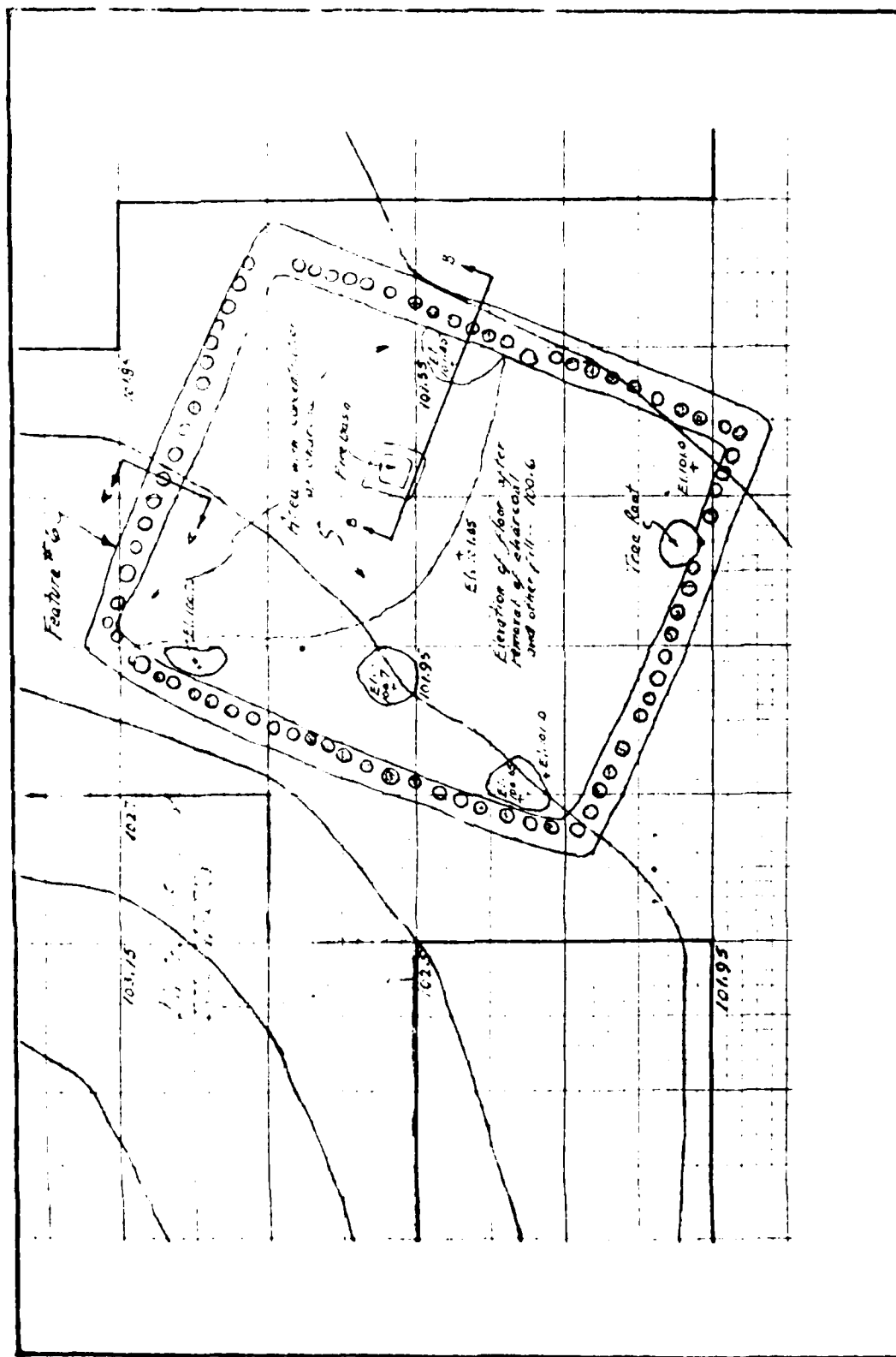


FIGURE 123. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURES 2 AND 3 AT SITE 1Ma^V31.



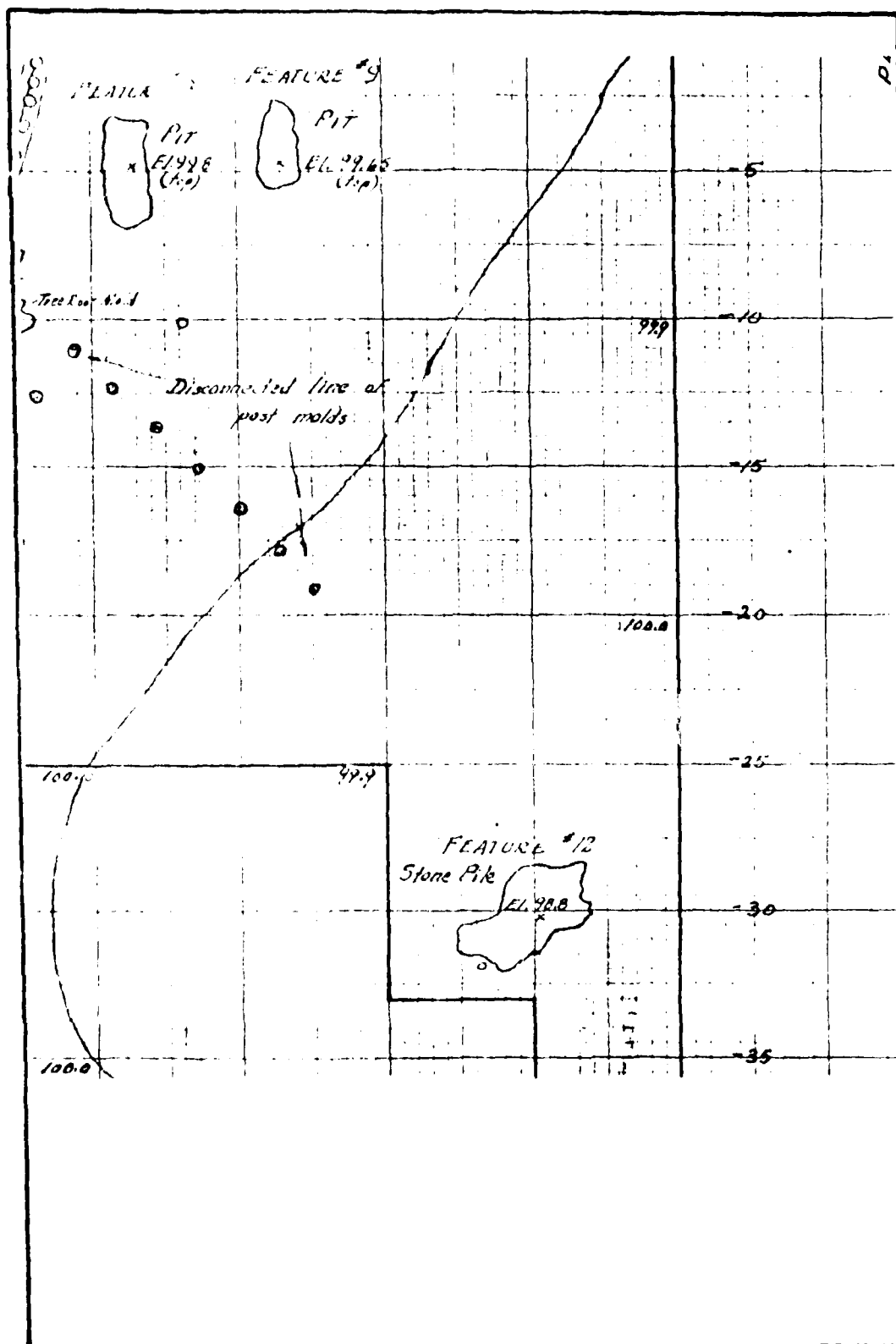


FIGURE 126. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURES 8, 9, AND 12 AT SITE 1Ma³31.

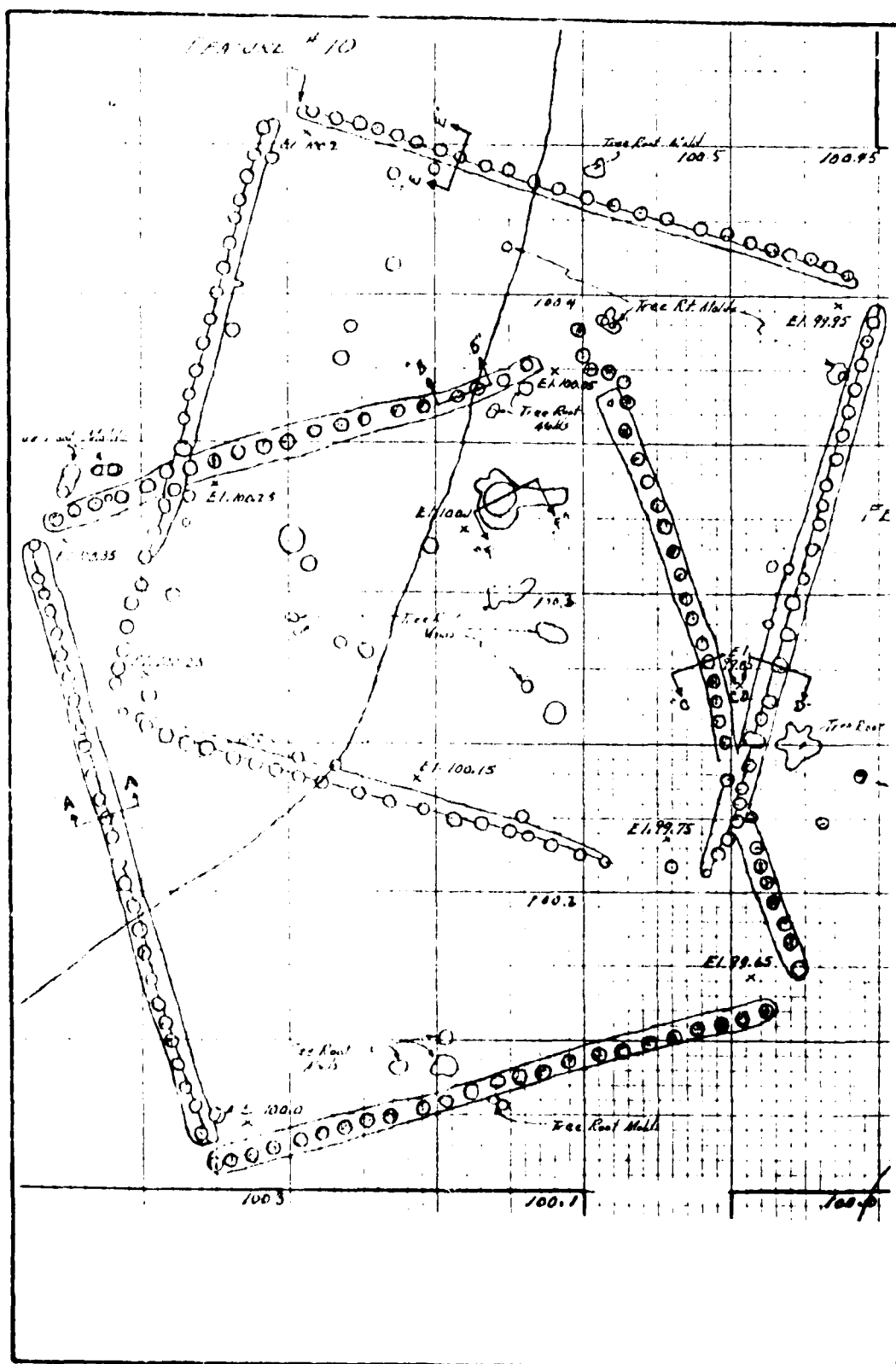


FIGURE 127. PORTION OF 1941 EXCAVATION MAP SHOWING FEATURE 10 AND 11 AT SITE 1MaV31.

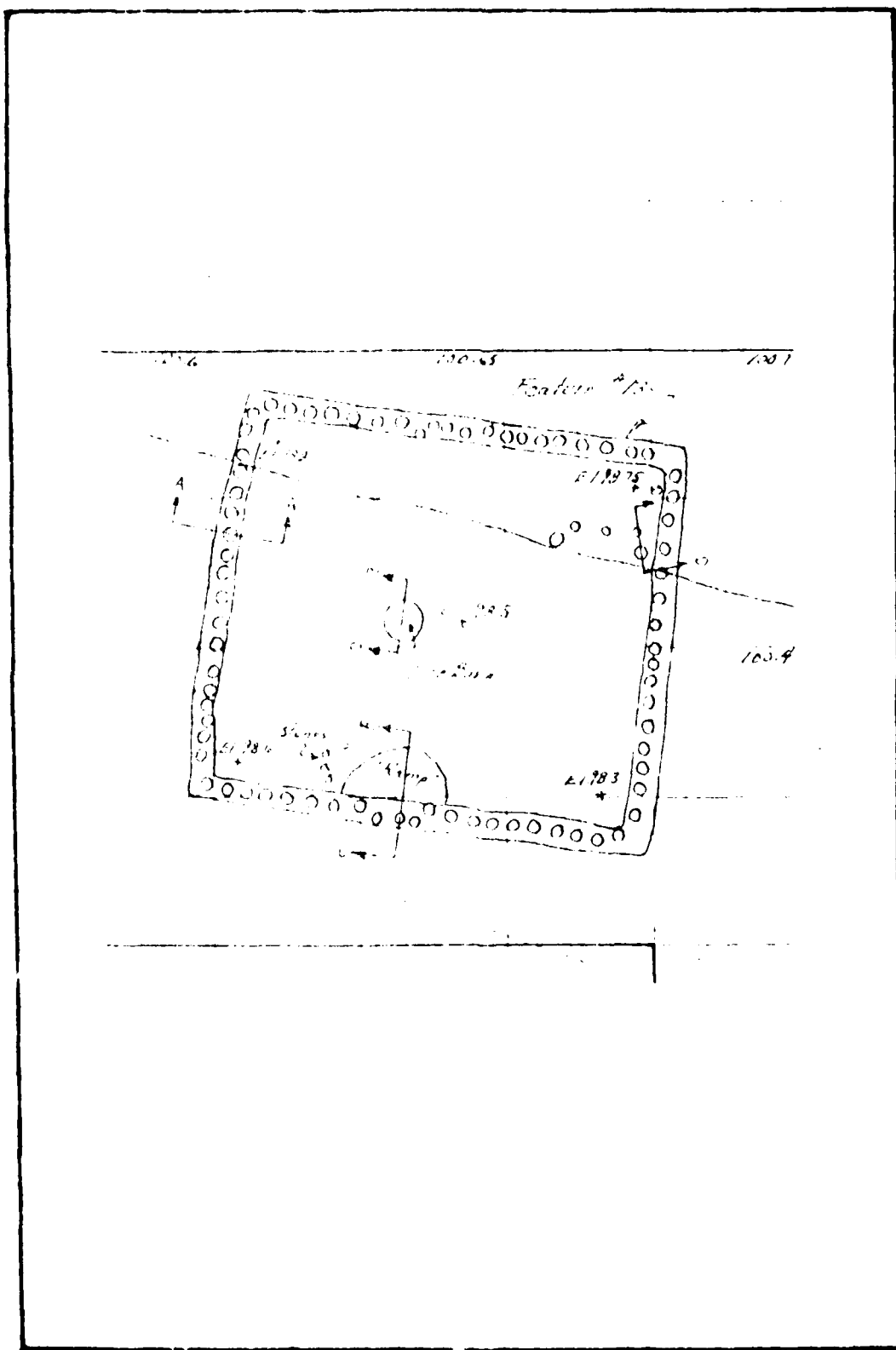


FIGURE 13. PORTION OF 1941 EXCAVATION "A" SHOWING FEATURE 13 AT SITE IMV31.

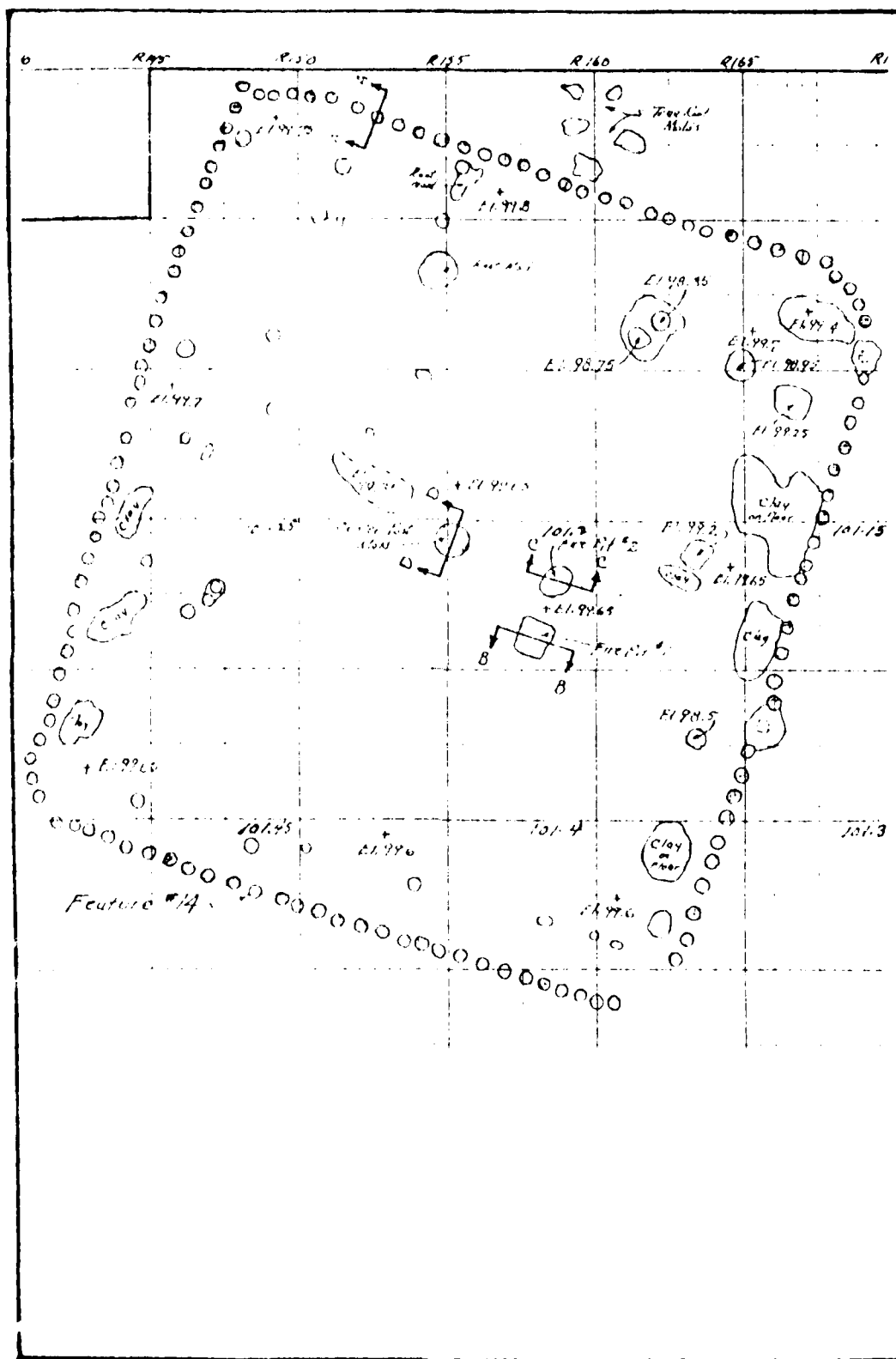
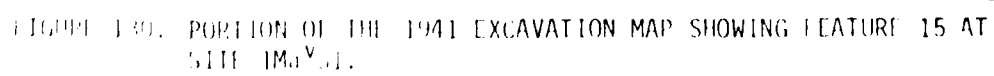


FIGURE 129. PORTION OF 1941 EXCAVATION MAP SHOWING FEATURE 14 AT SITE 1Ma^V31.



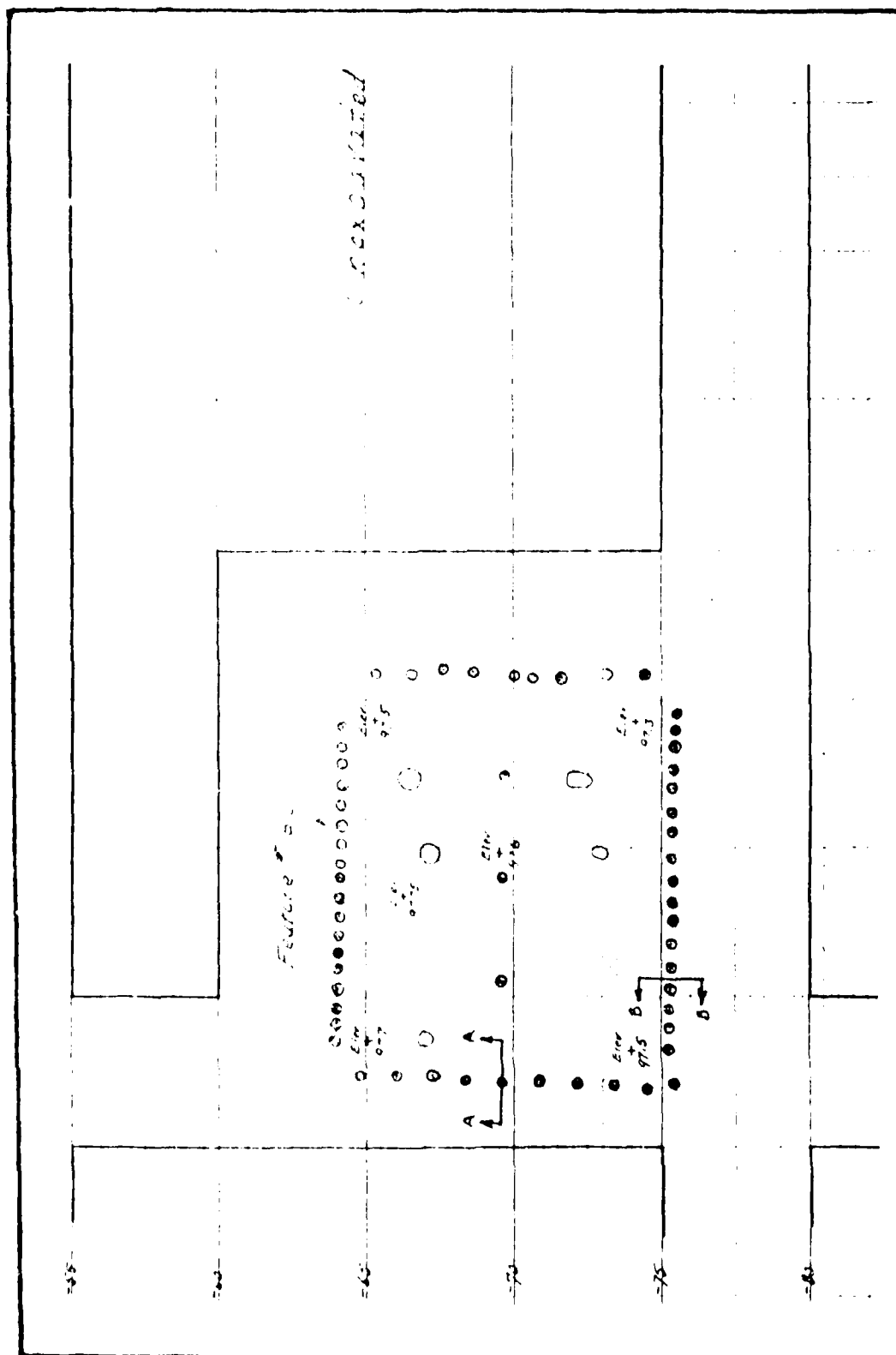


FIGURE 131. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURE 16 AT SITE 1Ma^V 31.

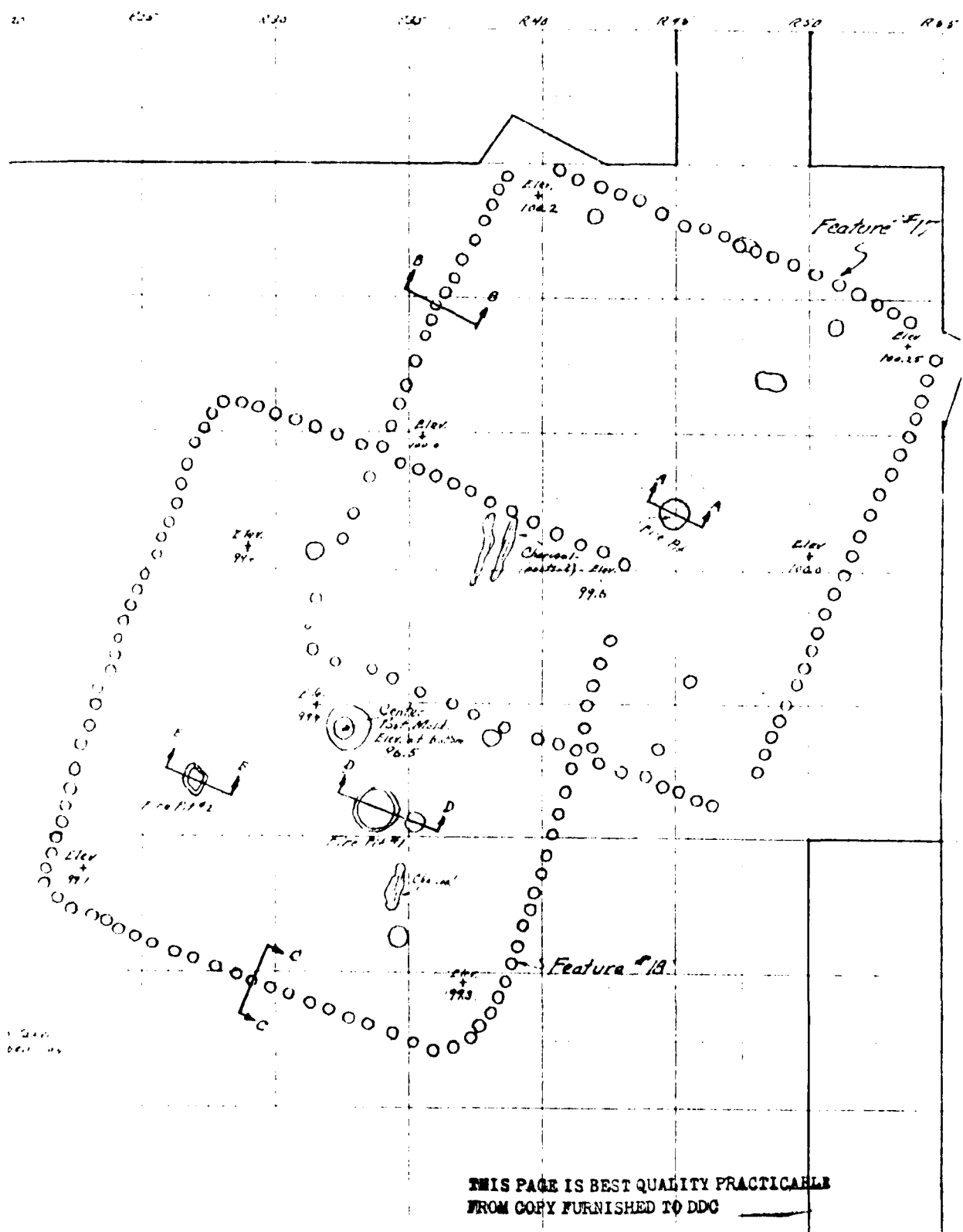


FIGURE 132. PORTION OF 1941 EXCAVATION MAP SHOWING FEATURES 17 AND 18 AT SITE 1Ma 31.

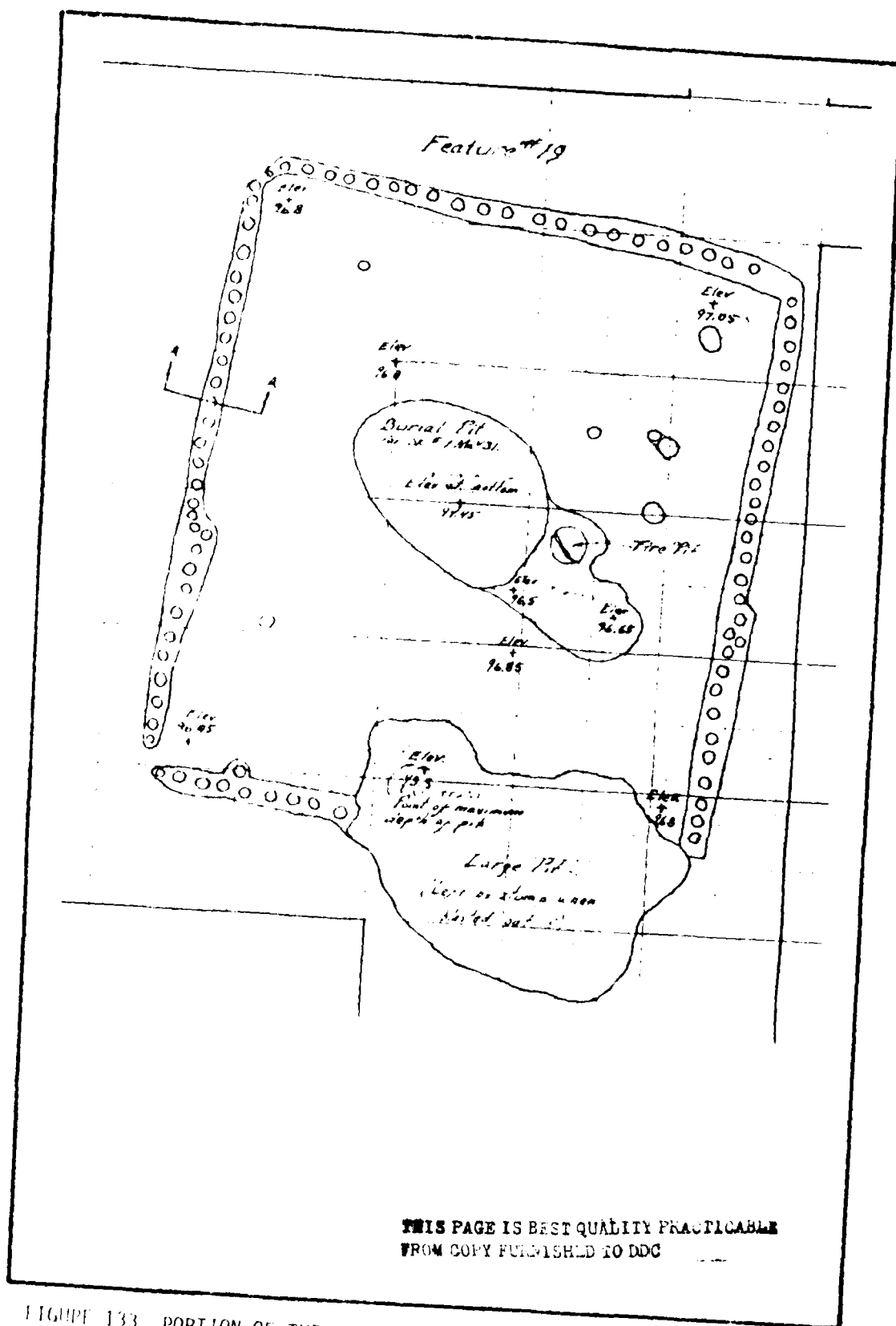


FIGURE 133. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURE 19 AT SITE IMa 31.

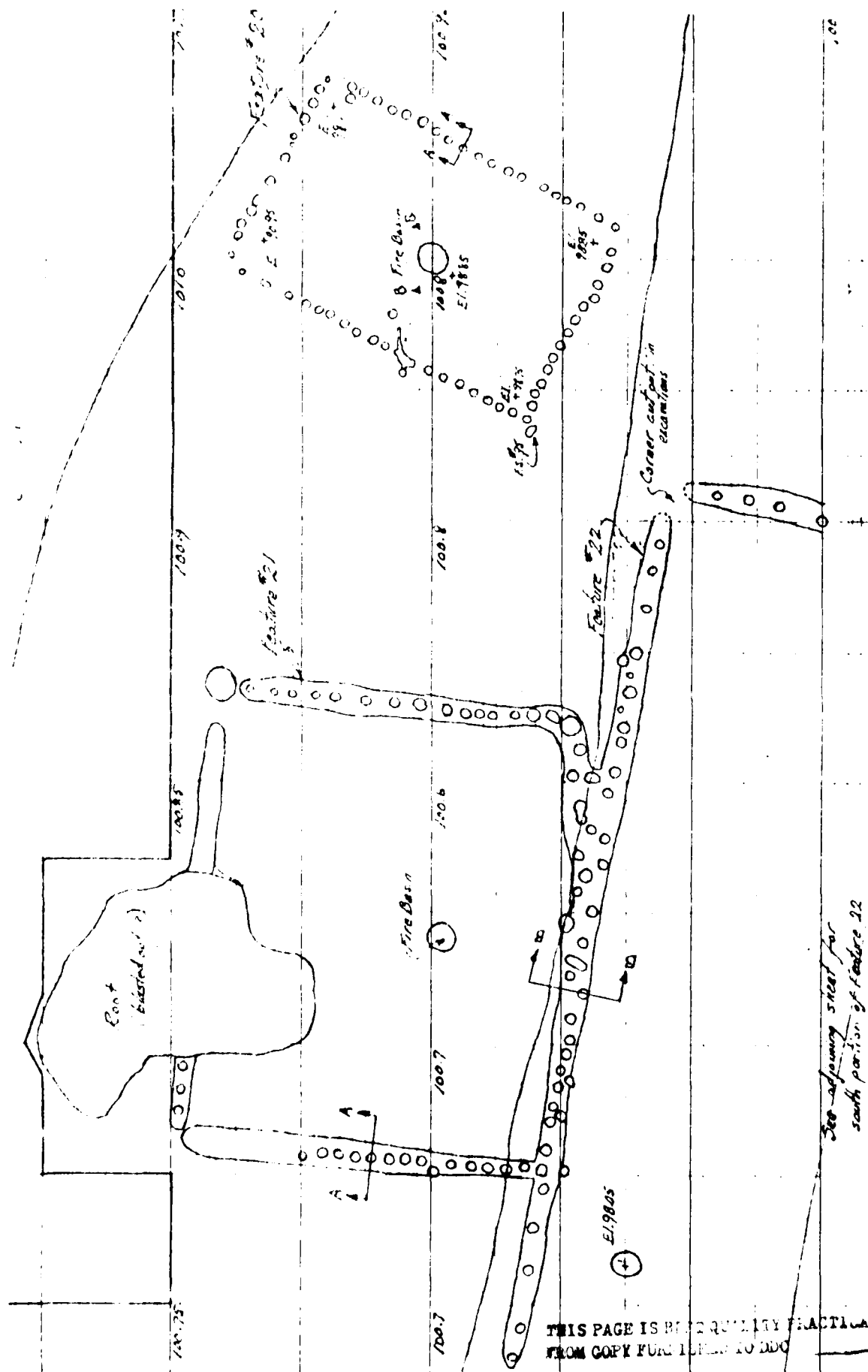


FIGURE 134. PORTION OF THE 1941 EXCAVATION MAP SHOWING THE NORTHERN PORTION OF FEATURE 22 AT SITE 1Ma^v31.

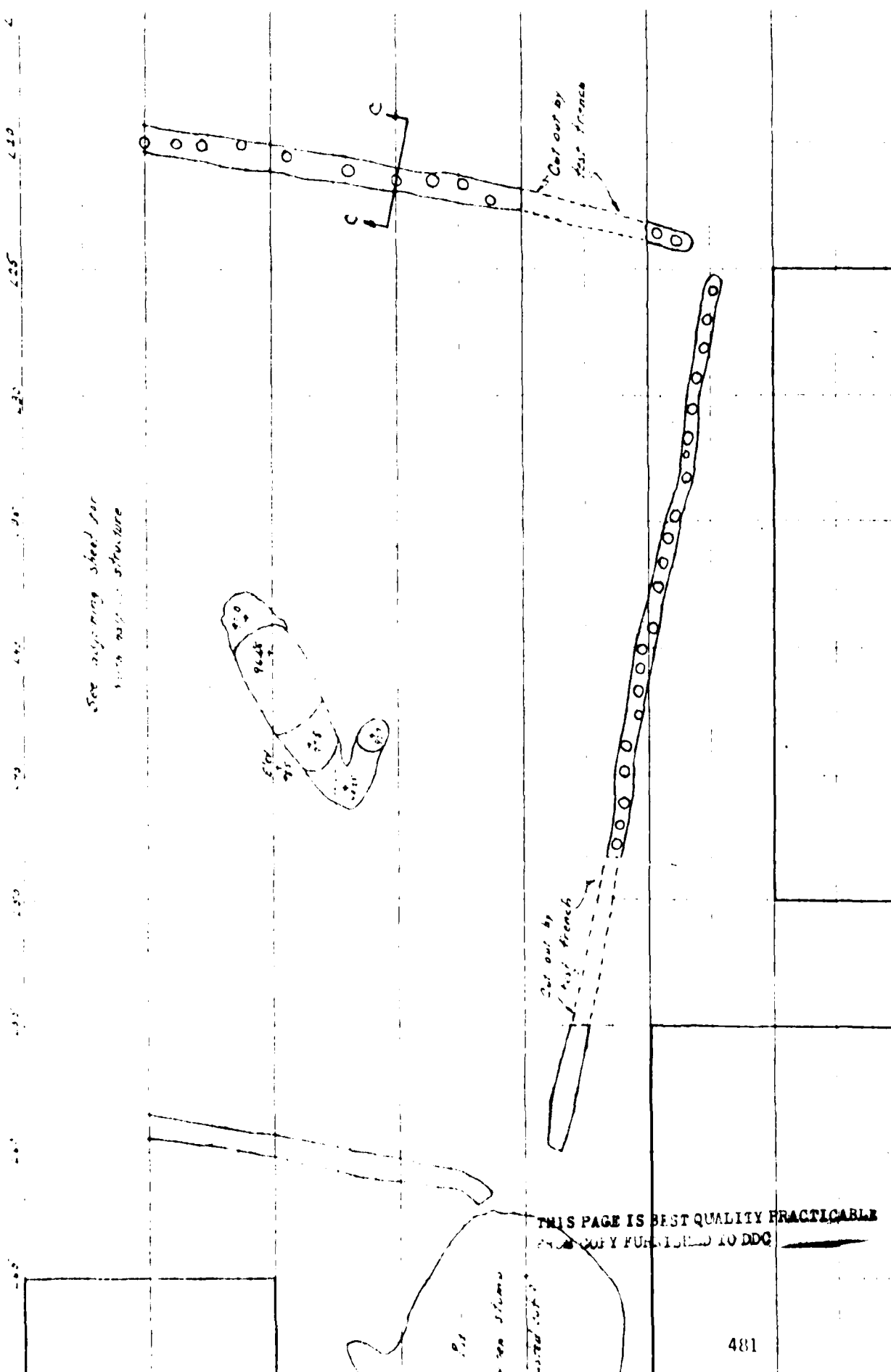


FIGURE 135. PORTION OF THE 1941 EXCAVATION MAP SHOWING THE SOUTHERN PORTION OF FEATURE 22 AT SITE 1MA^V31.

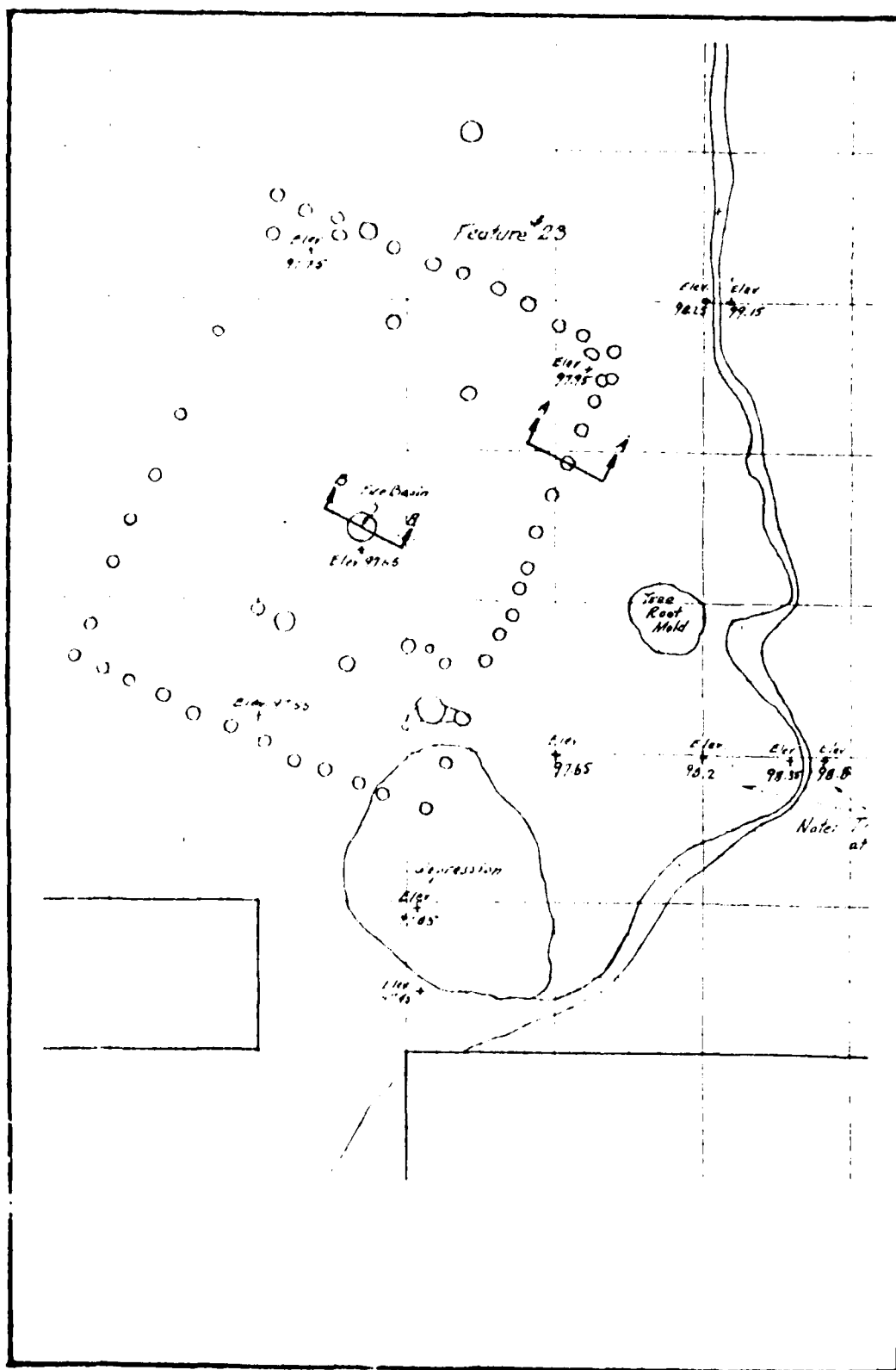


FIGURE 136. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURE 23 AT SITE 1MaV31.

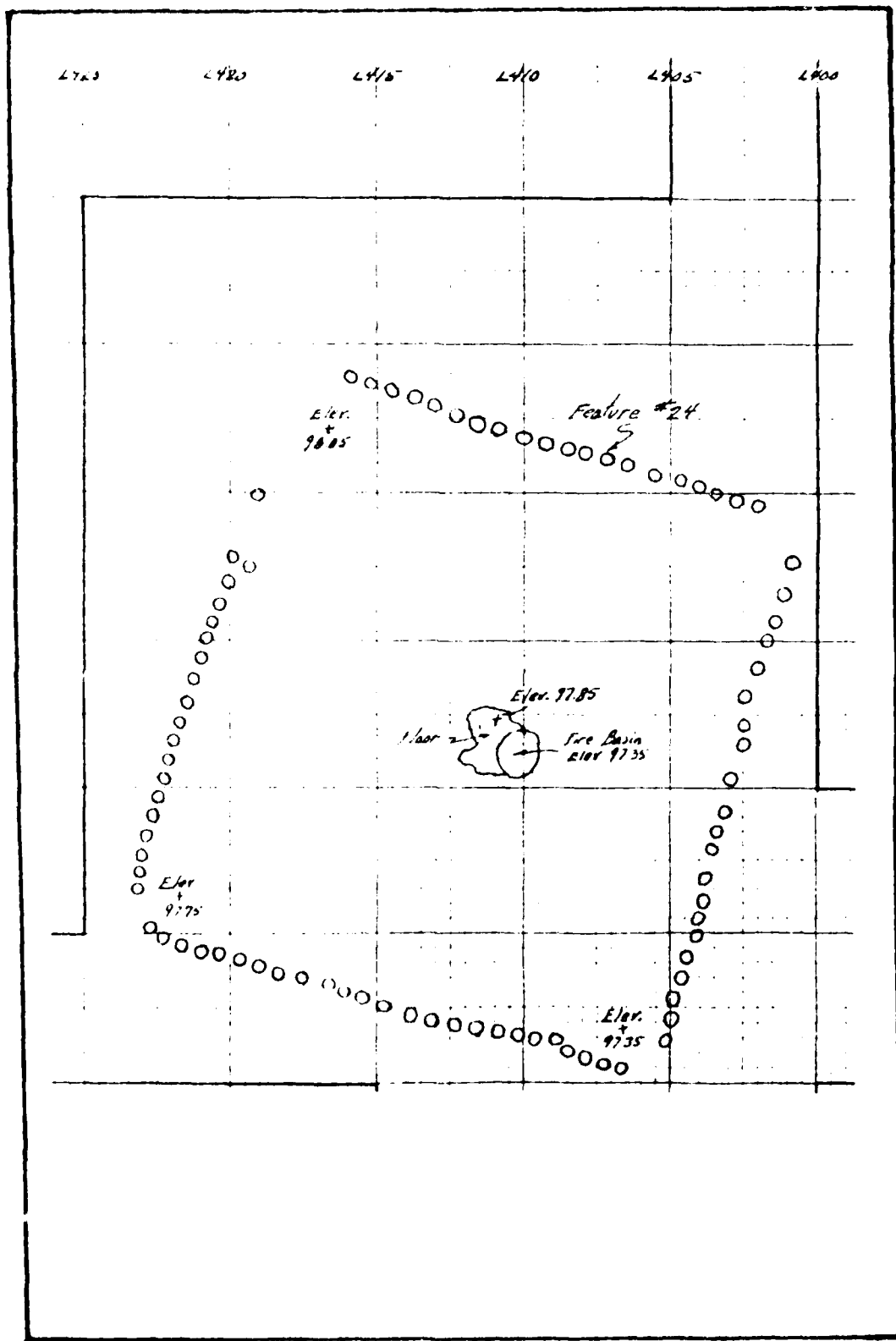


FIGURE 137. PORTION OF THE 1941 EXCAVATION MAP SHOWING FEATURE 24 AT SITE 1MaV31.

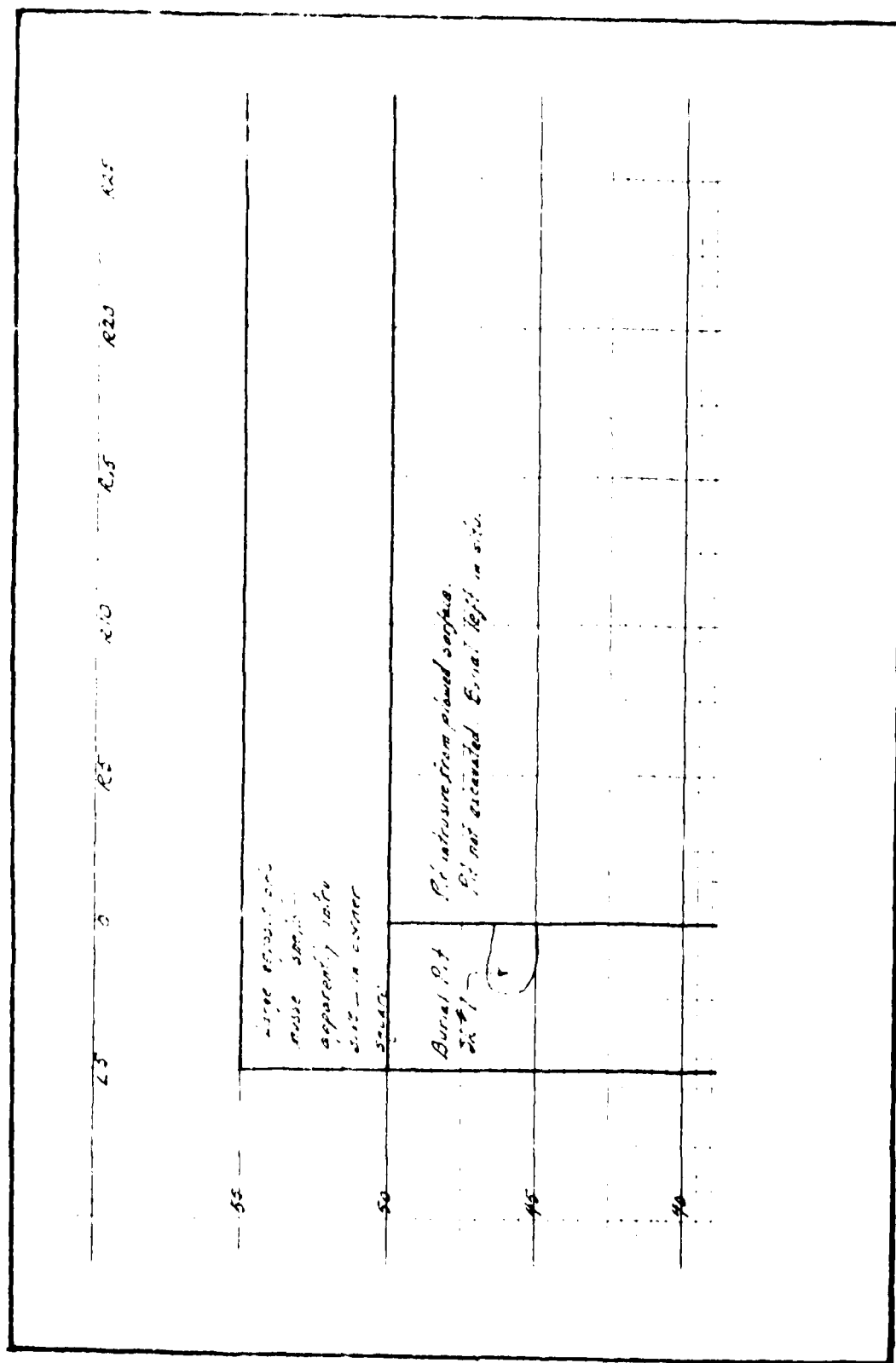


FIGURE 138. PORTION OF THE 1941 MAP SHOWING EXCAVATION TRENCH AT SITE 1Ma50.

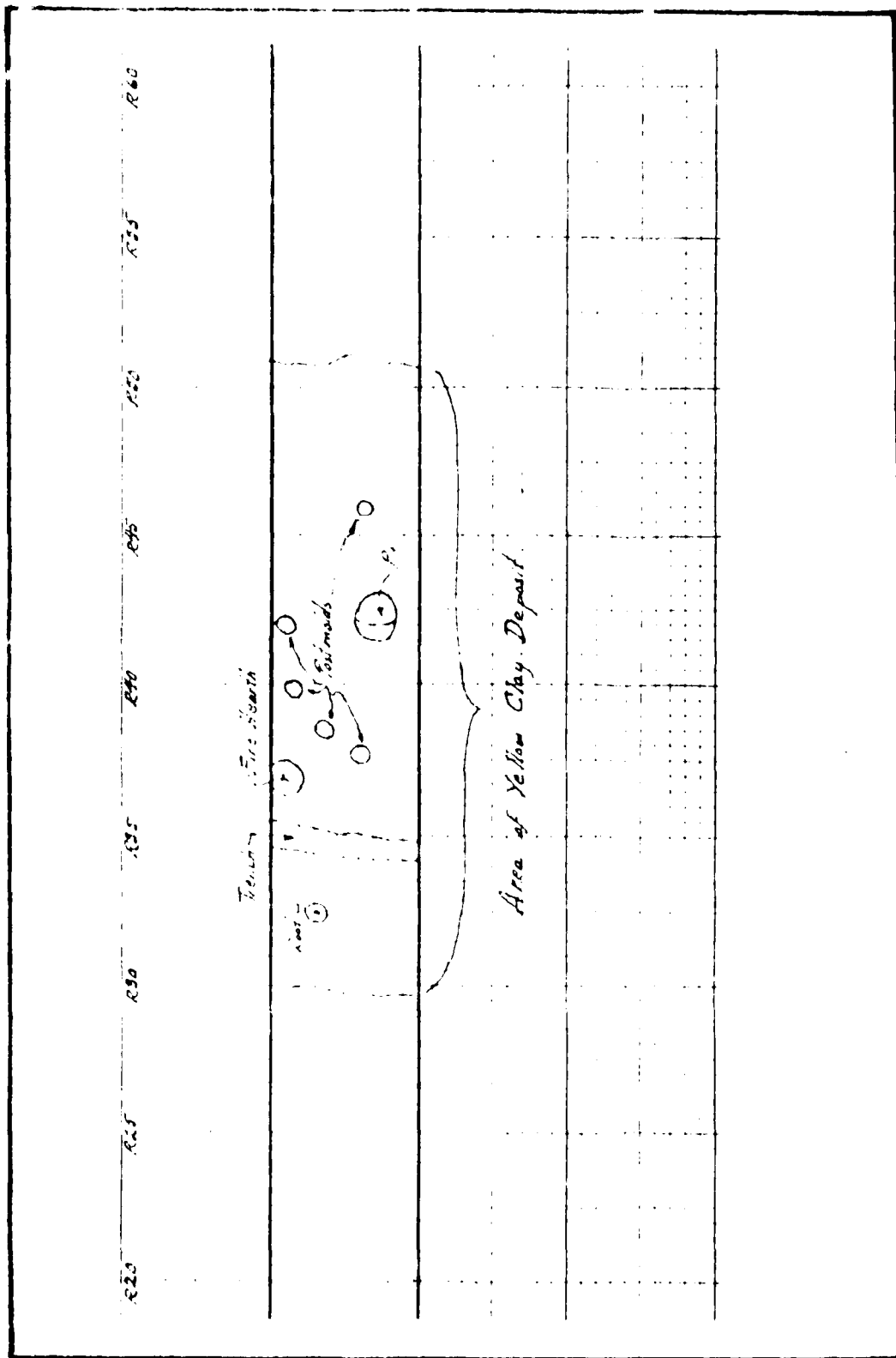


FIGURE 139. PORTION OF THE 1941 MAP SHOWING THE EXCAVATION TRENCH AT 1Ma50.

APPENDIX 2
RESULTS OF POLLEN ANALYSIS

During the course of excavations conducted at the 26 tested sites, soil samples were systematically taken from each test pit. Although any of these samples could have been submitted for pollen analysis, greater care was taken in the recovery of samples from undisturbed midden or features. A total of ten pollen samples from undisturbed deposits were submitted to the Texas A&M University Palynology Laboratory for analysis. The results of those analyses are presented below. As will be noted, the samples produced little information concerning either aboriginal subsistence or the general environment at the time of occupation.

POLLEN ANALYSIS

By

John Hutira

Introduction

Ten pollen samples from Redstone Arsenal, Huntsville, Alabama were processed at the Texas A&M University archaeobotany laboratory. This report presents the results of this investigation. Attempts to obtain information pertinent to economic activity and paleoenvironment from the pollen recovered proved futile, as almost no fossil pollen was preserved. Table 69 illustrates the provenience of each sample and the cultural context.

Laboratory Procedures

1. Thirty ml. of soil were measured for processing.
2. In 200 ml beakers, concentrated (30 percent) hydrochloric acid (HCl) was added to remove carbonates.
3. Samples were then rinsed several times at two hour intervals until HCl was removed.
4. Samples were then subjected to 70 percent hydrofluoric acid (HF) to remove silicates.
5. Samples were rinsed with distilled water until pH was at a safe level (5), indicating the removal of the HF.
6. Samples were then subjected to heavy density separation with zinc chloride (specific gravity 1.9; pollen has a specific gravity of about 1.3). This process entails centrifuging the samples for thirty minutes while the samples are suspended in zinc chloride. The heavy fraction is discarded. This is done to remove extraneous organic material.
7. The remaining portion then underwent the Erdtman acetolysis process (Erdtman, 1943:25) to remove any remaining organics.
8. After several rinses of distilled water, each sample was rinsed twice with 95 percent ethyl alcohol (EtOH) and once with 100 percent EtOH.
9. The remaining fraction was then transferred to one dram vials via tertiary butanol.
10. Slides were then prepared using silicon oil as the mounting medium. Slides and vials are currently stored at the Texas A&M University archaeobotany laboratory.

11. Each slide was counted, and identifications were aided by Dapp (1969). A minimum of two slides were counted, and up to four in some samples (170, 171) to obtain a statistically valid count of 200 grains (Barkley 1934).

Table 69. Provenience of the Pollen Samples Analyzed.

<u>SITE #</u>		<u>SAMPLE #</u>
1MA133	Fea. 1 (animal burial)	155
1MA133	Fea. 1 (animal burial)	156
1MA141	Midden-level 2	172
1MA141	Midden-level 4	173
1MA141	Midden-level 5	170
1MA141	Midden-level 6	174
1MA141	Midden-level 8	171
1MA210 (temp. 4)	Fea. 1 (refuse pit)	93
1MA210 (temp. 5)	Fea. 2 (refuse pit)	96
1MA210 (temp. 6)	Fea. 4 (refuse pit)	94

Results

The pollen frequencies obtained are presented in Table 70. As one can see, pollen preservation was poor to nonexistent. It is believed that the low amount of pollen recovered is a function of chemical and biological degradation. Recent studies by Rohr and Kilbertus (1977), Ellisick (1971), and Holloway (1980) have found that certain species of fungi and other microbiological factors penetrate and break down pollen. The presence of fungal spores in some of the samples would tend to indicate that some sort of activity such as this may have taken place.

The relatively high amount of what compares most favorably with *Centaurea* type (a Compositae) obtained from sample #170 is most likely contamination of some sort. First, most species are naturalized from Europe (Keamey and Peebles 1960:955-956, Small 1933:1484-1485). Additionally, the source of contamination may be most likely some

Kind of insect or rodent as this type of plant is insect pollinated. Middens, also present favorable environments for burrowing rodents and insects. Lastly, the almost perfect condition in which this pollen type was recovered leads to the belief that it was introduced as a contaminant and does not reflect original deposition.

Table 70. Raw Pollen Frequencies.

SAMPLE #	93	94	98	155	156	170	171	172	173	174
Compositae										
Low spine	0	1	0	0	0	1	0	0	0	1
High spine	0	0	0	0	0	5	3	0	1	0
Chenop-AM type	0	0	0	0	0	0	0	0	1	
C.f. Gentianae type	0	0	0	0	0	55	0	0	0	0
Gramineae	1	3	0	0	0	5	0	1	0	0
Pinus (frag.)	0	0	1	0	0	0	0	0	0	0
Populus	1	0	0	0	0	0	0	0	0	0
Total	2	4	1	0	0	66	3	1	2	1

In summation, the pollen preservation was far too poor to present any interpretable results. The presence of an (assumed) contaminant would indicate some rodent/insect activity in the midden area.

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Carolina Press, Chapel Hill.

APPENDIX 3 ETHNOBOTANICAL ANALYSES

As outlined in the Field Methods section of this report, flotation samples were systematically recovered from feature, postmold, and midden contexts during the course of excavations. Following the flotation of these samples, all vegetal residue was forwarded to Ms. Andrea Shea, University of Tennessee, who served as the project's ethnobotanist. The results of her analysis of samples submitted from 1Ma133, 1Ma158, 1Ma141, 1Ma156, and 1Ma210 are presented below; in addition, a brief discussion of pertinent data was also offered in the 1Ma210 site description.

TABLE 71. PLANT REMAINS BY WEIGHT IN GRAMS FOR SITE 1Ma141.

Feature	Total Wt.	Residual	Wickory Nut Shell	Corn	Seeds/ Fruits	Squash/ Gourd	Other	Wood/ Charcoal
Profile 7								
L-1 %	0.15	0.03 20.00	0.02 13.30	-0.01 -0.01	---	---	---	0.00 0.00
L-2 %	-0.01	-0.01 -0.01	---	---	-0.01 -0.01	---	---	---
L-3 %	0.12	0.05 41.70	0.01 8.30	---	0.05 41.70	---	---	0.01 0.01
L-4 %	0.05	0.01 20.00	0.02 40.00	-0.01 -0.01	---	---	---	0.02 40.00
L-5 %	0.01	-0.01 -0.01	0.01 100.00	---	---	---	---	---
L-6 %	0.04	0.01 25.00	0.01 25.00	---	---	---	---	0.02 50.00
L-7 %	0.01	---	-0.01 -0.01	---	---	---	---	0.01 100.00
Total Total %	0.38	0.1 26.30	0.07 18.40	-0.01 -0.01	0.05 13.20	---	---	0.16 12.10
Profile 1								
L-1 %	0.02	---	---	---	0.01 50.00	---	---	0.01 50.00
L-2 %	0.09	0.01 11.10	0.03 33.30	---	---	---	---	0.05 55.60
L-3 %	0.21	0.15 71.40	---	---	---	---	---	0.06 28.60
L-4 %	0.30	0.10 33.30	---	---	-0.01 -0.01	---	---	0.20 66.70
L-5 %	0.12	0.10 83.30	-0.01 -0.01	---	---	---	---	0.02 16.70
L-6 %	0.10	0.05 50.00	-0.01 -0.01	---	---	---	---	0.05 50.00
L-7 %	0.25	0.25 100.00	---	---	---	---	---	---
L-8 %	0.20	0.20 100.00	---	---	---	---	---	---
L-9 %	0.69	0.63 91.30	0.04 5.80	---	---	---	---	0.06 2.90
Total Total %	1.98	1.49 75.30	0.07 3.50	---	0.01 0.50	---	---	0.41 20.70

TABLE 22. COMPREHENSIVE ANALYSIS OF PRESENTLY KNOWN FRAGMENTS FOR SITE P-141.

SPECIES	PROFILE NO. (RELATIVE TO PROFILE 1)									TOTAL	
	L-1	L-2	L-3	L-4	L-5	L-6	L-7	L-8	L-9		
<u>Arundinaria</u> sp. Care				1		2				3	
<u>Carya</u> sp. Hickory										1	
<u>Fraxinus</u> sp. Ash										1	
<u>Gleditsia triacanthos</u> Money Locust				1						1	
<u>Gymnocladus dioica</u> Coffeetree		1								1	
<u>Juglans</u> sp. Walnut		1								1	
<u>Quercus</u> sp. Red Oak Group			1			1				2	
<u>Quercus</u> sp. White Oak Group							1			1	
<u>Quercus</u> sp. Oak					2					2	
<u>Ulmus</u> sp. Elm				1						1	
<u>Vitis</u> sp. Grape Vine		1								1	
Unidentifiable		1						5	2	8	
TOTAL	2	1	1	1	2	1	3	2	5	4	27

TABLE 73. SEEDS AND FRUITS BY NUMBER FOR SITE 1Ma141.

W=whole
F=fragments

Profile 1

L-1 Asteraceae Family (Fruithead), 1F
L-4 Fabaceae (Bean Family), 1F
Vitis sp. (Grape), 1F

Profile 7

L-3 Diospyros virginiana (Persimmon), 1F
L-2 Galium sp. (Bedstraw), 1F

TABLE 74. PLANT REMAINS BY WEIGHT IN GRAMS FOR SITE 1Ma210.

FEATURE OTHER	TOTAL WT.	RESTIDUAL	HICKORY NUT SHELL	ACORN	SEEDS/ FRUITS	SQUASH/ GOURD(Rind)	OTHER	WOOD CHARCOAL
1 & 4 (sw) %	6.82	2.50 36.70	0.93 13.60	0.03 0.40	0.02 0.30	-----	-----	3.34 49.00
1 %	10.77	4.09 37.90	2.72 25.30	0.03 0.30	0.14 1.30	-----	-----	3.79 35.20
1 (sw) %	12.20	4.60 37.70	2.50 20.50	0.02 0.20	0.02 0.02	0.01 0.01	-----	5.05 41.30
2 %	40.62	15.46 38.10	5.67 14.00	0.26 0.60	0.30 0.70	-----	-----	18.93 46.60
2 (sw) %	20.70	5.90 28.50	2.90 14.00	0.10 0.50	0.05 0.20	-----	-----	11.75 56.80
3 (sw) %	2.20	0.87 39.50	0.20 9.10	-0.01 -0.01	0.01 0.50	-----	-----	1.12 50.90
3L-1 %	48.29	15.32 31.70	7.73 16.00	0.19 0.40	0.05 0.10	-----	-----	25.00 51.80
3L-1 (sw) %	6.51	1.67 25.60	1.60 24.60	0.06 0.90	0.01 0.20	-----	-----	3.17 48.70
3L-2 %	49.84	19.34 38.80	5.04 10.10	0.80 1.60	0.32 0.60	-----	0.05 0.10	24.29 48.80
3L1&2 %	23.01	7.07 30.70	4.71 20.50	0.20 0.70	0.05 0.20	-----	0.10 0.40	10.88 47.30
3L1&2 (sw) %	6.86	2.55 37.20	0.72 10.50	0.02 0.30	0.01 0.10	-----	0.02* 0.30	3.54 51.60
4 %	2.09	0.82 39.20	0.12 5.70	0.02 0.90	-0.01 -0.01	-0.01 -0.01	-----	1.13 54.10
Total Total	229.91	80.19 34.80	34.84 15.10	1.73 0.80	0.98 0.40	0.01 -0.01	0.17 0.10	111.99 48.70
Post Molds 1 %	0.07	-----	-0.01 -0.01	-----	-----	-----	-----	0.07 100.00
2 %	0.12	0.08 66.70	-----	-----	-----	-----	-----	0.04 33.30
3 %	0.01	0.01 100.00	-----	-----	-----	-----	-----	-----
4 %	0.40	0.25 60.00	-----	-----	-----	-----	-----	0.15 40.00
5 %	1.57	0.67 42.70	-----	-----	-----	-----	-----	0.90 57.30
9 %	-0.01	-0.01	-----	-----	-----	-----	-----	-----
10 %	0.45	0.20 44.40	0.07 15.60	-----	-0.01 -0.01	-----	-----	0.18 40.00
11 %	0.21	0.19 90.50	-----	-0.01 -0.01	-0.01 -0.01	-----	-----	0.02 9.40
15 %	-0.01	-----	-0.01	-----	-----	-----	-----	-----

[illegible]

*possible tuber fragment

TABLE 75. OCCURRENCE OF WOOD SPECIES BY NUMBER OF FRAGMENTS FOR SITE 1Ma2

SPECIES	FEATURES												Pro										
	1&4	1	1 (sw)	2	2 (sw)	3 (sw)	3L-1	3L-1 (sw)	3L-2	3L1&2	3L1&2 (sw)	4	1	2	4	5	10	11	20	21	22		
<u>Carya</u> sp. Hickory	10	25	20	28	38	15	35	20	30	30	25	12		1	5	10	2	1	3		1		
<u>Fraxinus</u> sp. Ash	5		1	11	21	5	4	3	2	8	5						1						
<u>Gleditsia</u> <u>triacanthos</u> Honey Locust		1		1					4														
<u>Pinus</u> sp. Pine																							
<u>Quercus</u> sp. Red Oak Group	4	4	3	6	2		17		6	2	5	5	1	1	1	1	2			6			
<u>Quercus</u> sp. White Oak Group	5		5	8	3							2											
<u>Quercus</u> sp. Oak										1													
Osage Orange or Black Locust		1																					
Diffuse Porous			1															1					
Unidentifiable	10	20	27	15	20	4	10	15	20	15	15	10	5	1									
TOTAL	34	55	57	69	84	24	66	38	62	56	50	29	6	2	6	11	5	3	3	6	2		

WOOD SPECIES BY NUMBER OF FRAGMENTS FOR SITE 1Ma210.

3L-2	3L1&2	3L1&2 (sw)	4	POSTMOLDS																		TOTAL	
				1	2	4	5	10	11	20	21	22	23	24	25	26	30	31	32	34	36		37
30	30	25	12	1	5	10	2	1	3		1	3			1	2	1	4	2	2		326	
	5	5					1													1		67	
4																				1	1	6	
												1										1	
6	2	5	5	1	1	1	1	2		6		1	1	1								75	
			2																		5	26	
	1															2						3	
																						1	
							1												3			5	
20	15	15	10	5	1											1		2	1		3	194	
62	56	50	29	6	2	6	11	5	3	3	6	2	3	2	1	2	5	1	9	3	5	7	706

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TABLE 76. PLANT REMAINS BY WEIGHT IN GRAMS FOR SITES 1Ma133, 1Ma156, and 1Ma158.

FEATURE	TOTAL WT.	PESIDUAL	PORECEY NET SHELL	ACORN	SEEDS/ FRUITS	SQUASH/ GOURD	OTHER	COOL CHARCOAL
1	6.22	3.00 48.20	0.15 2.50	----	0.07 1.10	----	----	3.00 48.20
1Ma156								
Posthole	0.19	0.10 52.60	-----	-----	0.01 5.30	-----	-----	0.00 42.10
Level 3	0.20	0.05 25.00	-----	-----	-----	-----	-----	0.15 75.00
1Ma158								
Bag 70	1.95	-----	-----	-----	-0.01 -0.01	-----	-----	1.95 100.00

TABLE 77. OCCURRENCE OF WOOD SPECIES BY NUMBER FOR SITES
1Ma133, 1Ma156, and 1Ma158.

1Ma133			
Feature 1	Carya sp. (Hickory)	Fraxinus sp. (Ash)	TOTAL
Number of fragments	4	1	5
1Ma156			
Posthole	Quercus sp. (Red Oak Group)	Unidentified Bark	TOTAL
Number of fragments	10	3	13
1Ma158			
	Quercus sp. (White Oak Group)		
Posthole	5		
Level 3	3		

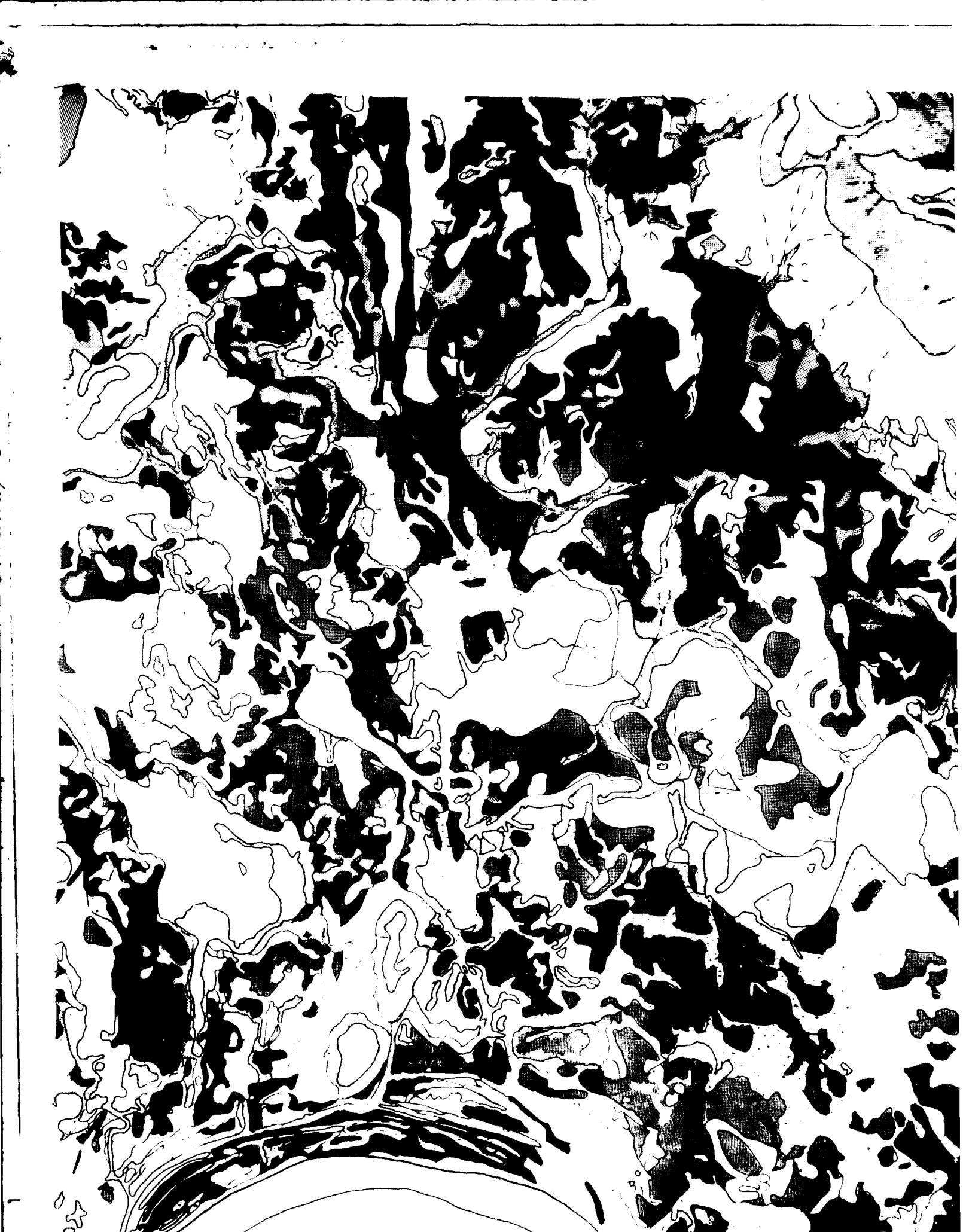
W=whole
F=fragments

Feature 1	<u>Cornus</u>	sp. (Dogwood)	<u>Liriodendron tulipifera</u> (Tupelo)
	1W		1X

Poaceae (Grass family)
1W, 1F

Posthole Asteraceae (Fruithead)
1F

Posthole Asteraceae (Composite family) (fruithead)
2f





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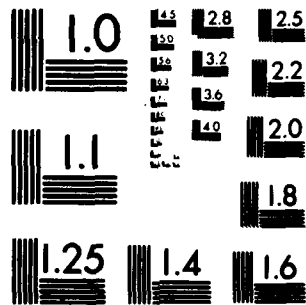
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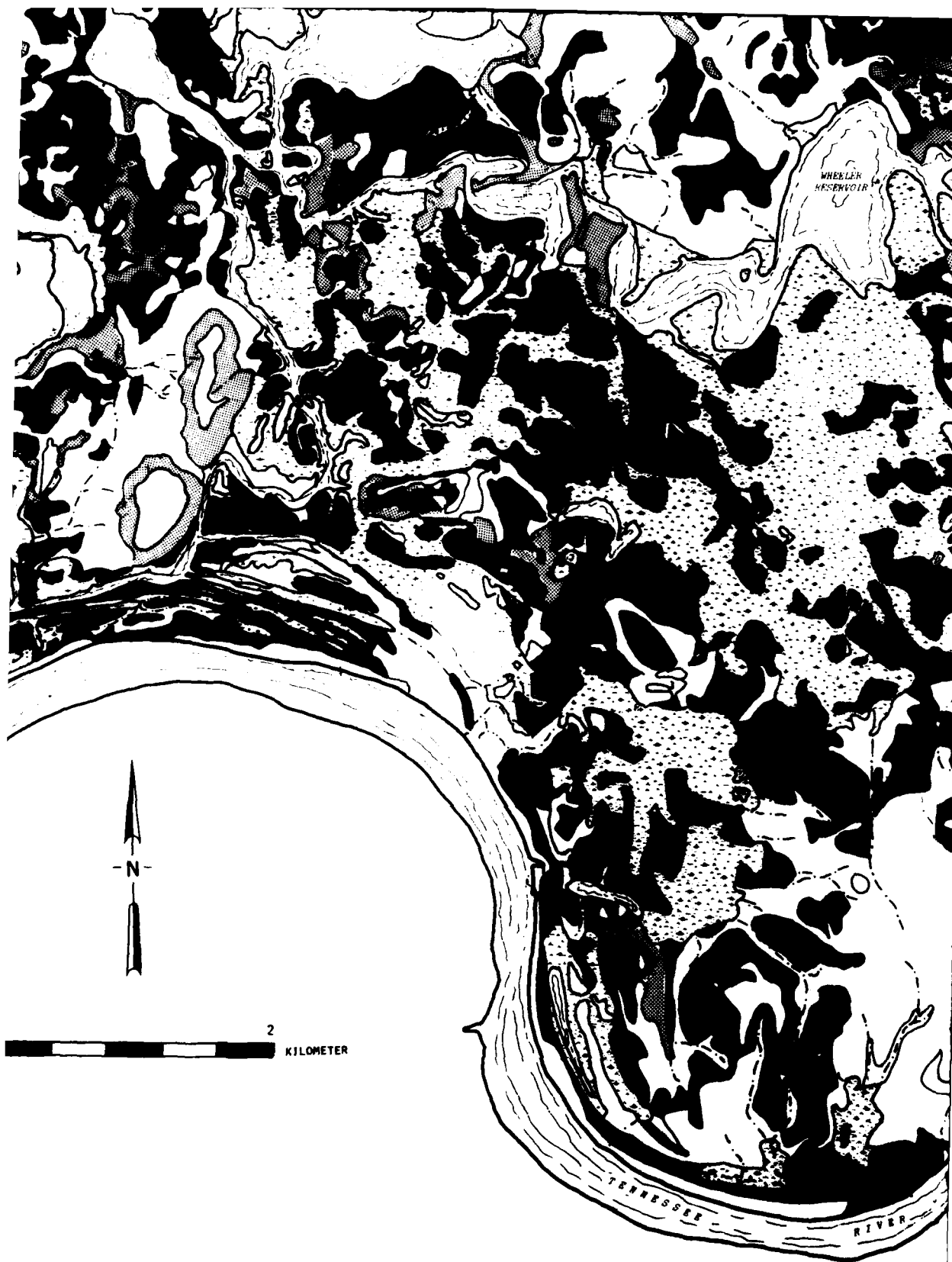
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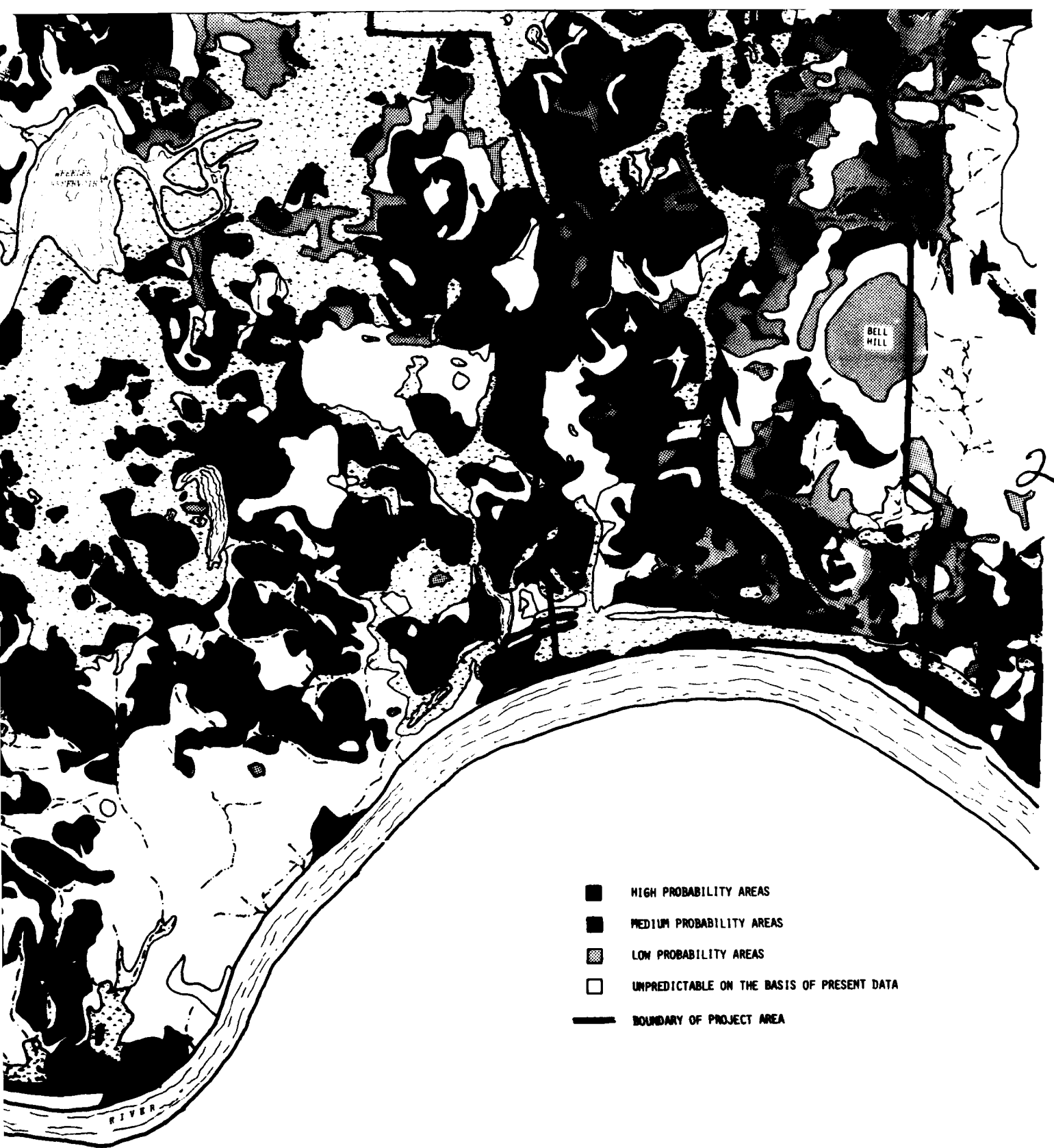




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FOLIO 1. MAP OF REDSTONE ARSENAL AND SURROUNDING AREA SHOWING PROBABILITY AREAS FOR THE OCCUR-
ANCE OF TWO VARIABLES, SOIL TYPE AND DISTANCE TO NEAREST WATER.



PROBABILITY AREAS FOR THE OCCURENCE OF CULTURAL RESOURCES. PROBABILITY AREAS ARE DEFINED ON
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